THE WAYS OF BEHAVIORISM

John B. Watson

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The Ways of Behaviorism

By the Same Author

BEHAVIOR, AN INTRODUCTION TO COMPARATIVE PSYCHOLOGY

PSYCHOLOGY FROM THE STANDPOINT OF A BEHAVIORIST

BEHAVIORISM

PSYCHOLOGICAL CARE OF INFANT AND CHILD

THE WAYS OF BEHAVIORISM

BY

JOHN B. WATSON, A.M., Ph.D., LL.D.

Formerly Professor Experimental Psychology
Johns Hopkins University

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Contents

	Introduction	1
I	What Is Behaviorism?	5
II	Why the Behaviorist Has No Instinct	22
III	The Behavior of the Gut—A Study in Human Emotions	44
IV	Memory as the Behaviorist Sees It	64
V	How We Think: A Behaviorist's View	78
VI	The Myth of the Unconscious	93
VII	Can the Adult Change His Personality	116
	Index	139

The Ways of Behaviorism

INTRODUCTION

IN THE year 1912 "behaviorism" was only a word—a harsh-sounding one at that. The group that understood its tenets and leaned toward it was small.

Would the years to come show behaviorism to be a genuine new and sound development in psychology or just another *ism?* The old line psychologists trained under Wundt freely predicted that it was only a revolt and like most revolts could easily be put down.

But behaviorism was not a revolt or protest. It was a new way of looking at the most important things about human beings—an objective way.

What are the most important things about human beings? When answering let us leave out all speculations about man's origin, his soul, his life hereafter. Aren't the most important things *what he does; how he behaves?* How he works; how he plays? What he does when he is angry, scared, in love? Is he lazy, slovenly, untrustworthy, undependable, a grafter, rude to his inferiors, cringing to the group over him? And don't we as we study him get to the point where we can almost surely *predict* how he is going to act when in a certain situation? Again when we know him can't we arrange

situations to get him to act in certain ways? Flattery by a man over him may make him swell up and preen his feathers and accept a project which he had hitherto steadfastly refused to entertain.

Behaviorism is the scientific study of human behavior. Its real goal is to provide the basis for the prediction and control of human beings: Given the situation, to tell what the human being will do; given the man in action, to be able to say why he is reacting in that way.

It is a science based on very simple principles—upon common sense and not speculations. What is man's untutored behavior like? To answer we go to the nursery and study the reactions of the infant where we see reaction patterns forming. Is his behavior inherited or *learned*—and how much is inherited and how much *learned?* Well, go to the laboratory and find out. Why do men and women get married—why divorced—what effect has prohibition had upon human behavior—woman suffrage? Let us study the problem by observing human beings as we would study the effect of continuous light upon the growth of a plant.

Stating our goal in slightly more technical language, we can say that the behaviorists' job is—*given the stimulus, to predict the response—given the response, to predict the stimulus.* A blow on the patellar tendon (stimulus) evokes the knee jerk (response). Stimulating the tongue with vinegar (stimulus) makes the sali-

vary glands pour out their secretions (response). These are life reactions reduced to their simplest terms. But according to the behaviorists, life's most complicated acts are but combinations of these simple stimulus-response patterns of behavior. Even thinking—memory—personality—are but easily understandable integrations of stimulus-response behavior.

Behaviorism thus leaves out speculations. You'll find in it no references to the intangibles—the unknown and the unknowable "psychic entities." The behaviorist has nothing to say of "consciousness." How can he? Behaviorism is a natural science. He has neither seen, smelled nor tasted consciousness nor found it taking part in any human reactions. How can he talk about it until he finds it in his path? His way—his method is to build a psychology without it. He does the same with the subdivisions of consciousness—such as sensations—perceptions—affections—will and the like. In behaviorism you find none of these grand old speculative bugaboos about which so many millions of pages have been so fruitlessly written.

Because of its simplicity and matter-of-factness behaviorism has made rapid progress. Universities now teach it. The public itself demands some knowledge of it.

The present book is frankly directed to the public. However, it makes no effort to be "popular." I think

an experimenter comes to think more clearly and in simpler words as he understands more about his own work and more about life. This book—much of which has appeared in *Harper's Magazine*—should be looked upon as the author's best effort to make his own position clear to himself as well as to others.

JOHN B. WATSON.

Malba, Long Island,
New York.

CHAPTER I

WHAT IS BEHAVIORISM?

I

A FEW years ago in psychology we heard only of Freud and of his method, psychoanalysis. With this method his loyal subjects assured us they could solve all psychological problems. To-day when every shop girl will tell you of her dreams and complexes, psychoanalysis is no longer a topic of interest in drawing-room conversations, not because anyone is particularly shocked by the discussion but rather because its novelty has gone.

So it is with all new movements in scientific fields. There was possibly too little science—real science—in Freud's psychology, and hence it held its news value for only a relatively brief span of years.

At this moment there is a new psychological claimant for public interest. During the past ten years it has been threshed out in university circles; now the newspapers are beginning to feed it to the masses, but still in broken doses.

This contestant is behaviorism.

The Ways of Behaviorism

Behaviorism has been an independent study in the larger universities since about 1912. It represents what must be looked upon as a real renaissance in psychology. Up to that time the so-called subjective, or introspective, psychology held complete sway. Subjective psychology was defined as a study of the mind—really of your own mind, since no one else could look in on it and see what was going on there. And when you did look, what did you see? Since you were trained in the system and in the vernacular of James, Angell, Ladd, and Wundt, you said you saw *consciousness*. And then you tried to analyze this consciousness. What was it? . . . Why, one must describe it by enumerating the units that compose it. Consciousness is made up of sensation units like redness, greenness; sensations of tone, smell, temperature, and the like, and of units of *feeling* tone called "pleasantness" and "unpleasantness." Now when enough of these sensation units are simultaneously present and accompanied by one or another of the two feeling tones, you have what is called a *perception—e.g.,* the perception of an orange or an apple.

The matter of consciousness and what constitutes it was made still more complicated when they insisted that when perceptions were absent, that is, when no objects were in front of us, consciousness was made up of representatives of objects called *images*.

All the data of this type of psychology were thus sub-

jective. The only method of studying this data was by introspecting—looking within your own mind. Hence, we call such psychologists subjective psychologists, or introspective psychologists. Verification of findings—really the first objective of every true science—is thus forever denied the introspective student of psychology.

This was the time-honored analysis of mind. It was as thoroughly entrenched as the Bible—as philosophy itself. Surely no one could ever be bold enough or rash enough to question that there is such a thing as mind or that it is made up of conscious units.

And yet this is just what the behaviorist did.

In one sweeping assumption after another, the behaviorist threw out the concepts both of mind and of consciousness, calling them carryovers from the church dogma of the Middle Ages. The behaviorist told the introspectionists that consciousness was just a masquerade for the soul.

Behaviorism's challenge to introspective psychology was: "You say there is such a thing as consciousness, that consciousness goes on in you—then prove it. You say that you have sensations, perceptions, and images—then demonstrate them as other sciences demonstrate their facts."

Naturally, they could not meet this challenge. The only argument open to the introspectionist was that used by every time-honored exhorter since history began, the

argumentum ad hominem, "no consciousness—no mind! Maybe the behaviorist has no consciousness, no mind, but you and I have."

If the study of mind—the analysis of consciousness—is not what psychology is about, what then is its field and what is its goal?

The behaviorist viewpoint is just common sense grown articulate. Behaviorism is a study of what people *do. What is this man doing now?—any answer to that question made by a trained observer is a psychological fact or happening.* After observing man's behavior long enough, the behaviorist begins to say, "this man or that man will do so and so under such and such conditions." Take a simple case. John Smith will run every time he sees a snake. Every woman in this closed room will scream, stand on a chair or pull her skirts tightly around her if I turn loose ten fierce wild rats. We have begun to make *predictions* about psychological happenings—the first step in any science.

Every science starts this way. It observes in a more or less hit and miss way the happenings round about. It next gets to the point where it can make *predictions, e.g.,* the sun will rise to-morrow—there will be a total eclipse of the sun visible in New York in 2024—Halley's comet will be seen again in 1986.

The next stage in any science is to get "control" of

its happenings. Astronomy never can get control. It cannot produce eclipses or prevent them. (Even here possibly we should not be dogmatic!) Chemistry is getting control. Biology is getting control. Can psychology ever get control? Can I make some one who is not afraid of snakes, afraid of them and how? Can I take some one who is afraid of snakes and remove that fear? How?

In other words, the starting point of behaviorism is like that of every other science. Looked at in this way, the old, subjective psychology never had any right to be called a science. To be a science, psychology must use the same material that all other sciences use. Its facts must be capable of verification by other capable investigators everywhere. Its methods must be the methods of science in general.

II

What are the phenomena or happenings that the behaviorist studies in his psychology (human)? He limits his field to the study of man. He makes the field still more circumscribed. He will not attempt to study the physico-chemical make-up of man. He will study only one thing—what man does. Observation shows that he is always doing something—always behaving. He is be-

having even when asleep, when in coma, when sitting motionless gazing into the fire.

Suppose I am a stranger scientist just down from some distant planet. I know nothing of human beings as they exist on this earth. Suppose, further, that I am in a balloon so situated above the center of New York that I can watch the city and the surrounding territory. At eight-thirty in the morning I see millions of people hurrying into the city in trains, in automobiles, in subways, on ferries. The movements are rapid, confusing. There seems to be no more system in these movements than in the hurrying, scurrying movements of ants when their nest has been disturbed. With my eye aided by special instruments I follow groups of these individuals. I note that they enter great office buildings, department stores, restaurants. Some begin to wait on customers, some start to work on typewriting machines, others begin to cut and fit clothes, and still others start sewing on power machines. I finally arrive at the conclusion that the people *are going to work*. Just think what a volume I could carry back to Mars on the behavior of New Yorkers if from some central position I could observe their whole twenty-four-hour behavior for a few weeks or months!

Now you are not accustomed to think of accumulation of simple facts of this kind as data of psychology. You have grown up with it. It is part of your everyday life.

Yet when you go to a foreign country it is just these kinds of observations you have to make before you can get along in your foreign environment. From this standpoint you can see that everybody is something of a psychologist.

The people in Mars, after reading my first general report, decide to send me down again for the study of specialized features of human behavior. What are their school and church systems like? What is their social behavior like in the sense of their manners and customs and ethics? What is their sex life like throughout the life cycle? Their home life? What do they read? Do they go to plays and to what kind of plays? What rôle does the cinema play in their lives?

From these studies I carry back to Mars a tremendous amount of narrow specialized information on the habits and customs of New Yorkers. This also is behavioristic psychology.

After going over my facts and inferences, my colleagues in Mars decide that they are in need of still more specialized data. They tell me to go back and pick out some one individual and bring back a complete report of his behavior. I can carry out these studies only by attaching myself to some individual, say John Smith. By observing him carefully day in and day out I find out his occupation. He is a bricklayer. He can lay two thousand bricks a day when he lets himself out, as, for

example, when building his own home or when working by the job on his own contract. I find, though, that on most jobs he is not allowed to work a full day. He must work only a certain number of hours each day. He has to join an organization called a union and, as a member of a union and under the conditions of the union, he rarely lays more than eight hundred bricks per day. For this he receives a certain fixed sum. I find that this man is married, that he has a small home in the suburbs, a Ford car bought on the instalment plan, and a radio bought on the same plan. I find that he drinks a great deal, that he abuses his wife and children, spends a considerable part of his time in the poolroom, that he is given to temper fits, that he is morose and sullen to his companions, that he is not particular in meeting his monetary obligations. He uses only fifteen hundred English words—he practically never writes a letter and he reads only the *Daily Tabloid*. I may wish to make a still more circumscribed study of his behavior, so I invite him into my laboratory and study the rapidity with which he can form new habits. He has never learned to run a machine lathe. How quickly can he learn to do this? He doesn't know any French. How soon could I teach him to speak the French language moderately well? He has not a system of immaculate personal habits. How soon could I teach him these? And what methods should

I have to use in order to teach him to put on this new behavior?

All business, as well as all social life, is based upon these kinds of observations—and they are psychological observations although not necessarily very articulate ones.

Once again I assemble my data and take them back to my colleagues. After digesting them, they decide that adult human behavior is too complicated to understand without knowing something of the infancy and childhood period of man. We do not understand why one man is a bricklayer, another an artist, another a gambler. We cannot understand why some men are carefree and sober, make good husbands, and others not. We cannot understand why some men never leave home, never get married, and never are seen in women's society. We shall have to have man's early behavior investigated to see if it throws light on later behavior. Are such differences due to inborn differences in behavior—to differences in instincts, or merely to early differences in training?

Again I come back to earth but this time I begin my observations on newborn infants. I note carefully their behavior at birth, what new forms of unlearned behavior appear at definite intervals after birth. I study, too, how early habit formation can begin in these very young infants and note the various factors which make new habits form. In other words, I begin to tease out by my ob-

servations what part of man's behavior is inherited and what part is learned. This also is psychology.

You will notice that in all of this description we start from general observations of persons for which no laboratory or special instruments for study are necessary and that we end with the newborn infant in the laboratory, using every bit of instrumentation for the study of our phenomena which has been devised up to the present time. In other words, behaviorism breaks down the distinction between subjective and objective phenomena. All of the phenomena connected with human beings are objective, even the things you now call "memory" and "thinking"! Again, you have been in the habit of calling these more general studies social psychology or sociology, and the more narrow studies where the laboratory is involved psychology proper or experimental psychology. The behaviorist does not believe in these old distinctions. *The whole thing is psychology.* Along with the breaking down of these distinctions comes a threatening note to the whole of philosophy. With the behavioristic point of view now becoming dominant, it is hard to find a place for what has been called philosophy. Philosophy is passing—has all but passed, and unless new issues arise which will give a foundation for a new philosophy, the world has seen its last great philosopher.

So far we have had to take our psychological happen-

ings just as we found them. Have we really gone far enough to be able to predict anything of consequence about individuals? Common sense, rather than scientific psychology, has gone a certain distance in prediction—you can't live with people without making predictions about them. You know in advance what they are going to say and do. That is why most people are so dull. If I fire a revolver behind any ten individuals who are sitting quietly in a room, I can predict without fear of contradiction that at least nine out of ten of these individuals will jump, scream, change rate of respiration and heartbeat. If I throw a hundred unclothed individuals who have never learned to swim into a pool of water, five hundred yards in diameter, all of them will drown unless somebody comes to aid them. If you will think over the problem for a moment, you will see that most of our institutions, banks, churches, great mercantile houses, the institution of marriage itself, are all based on the fundamental supposition that human behavior in general is predictable. Just whisper a word of a gold strike and you can safely predict a stampede. Just whisper a word of scandal about a woman placed high socially, and every tongue in her set will clack. If you wish to make a man preen himself, let some woman notice him when none of his critical friends is around. To make a man swell out his chest, praise and flatter him a bit. To make a

woman dress most carefully, tell her her rival is to be present at a given function.

This level of predictability has been reached by the slow accumulation of psychological data through all ages, rather than by the efforts of trained psychologists. The trained investigator must now come in and tell us more accurately about what *this* individual is sure to do in the presence of the life situations he must face; will he work —does he lie—will he steal—will he break under stress?

What about the *control* of psychological phenomena? Can you make an individual display any given bit of behavior by any kind of psychological technic, the way the chemist can make water appear by bringing hydrogen and oxygen together under certain conditions?

We can't go very far in this direction now. But behaviorism has only just been born. Until about thirty years ago biology itself was upon a purely descriptive level. Darwin, in the fifties, was a great observer of facts. Upon the basis of his observations, he built up his theory of *descent*. He never went very much farther. To-day there is an experimental biology. It seeks to control descent by manipulating the chemical and physical environment of plants and animals. It attempts to change and modify species, to control growth and, in general, to alter the course of inheritance.

Psychology is still largely at a descriptive level. Control of psychological phenomena is in a more backward

state than is the case with other sciences, partly because it is a newer science, but more largely because psychology wasted its time so long in trying futilely to study mind instead of behavior.

We have made a beginning. Here is a group of moths quiet in a very dim light. Suppose I decide to arouse behavior to make them fly to the right-hand side of the room. How can I control that behavior? I light a candle and put it in the exact position in the room to which I want the moths to fly. In a short time the moths become active and fly toward the source of the light. It may have taken the behaviorists days, weeks, or months to discover this way of controlling the insects. Once found out, it becomes a part of the technic of *every* investigator. The *response* (act, happening) is flying toward the source of the light; the *stimulus* is the lighted candle. In this simple observation you have a part of the mechanics of behavioristic psychology typified in its most elementary form—no response without a stimulus. Every adequate stimulus must produce some response immediately.

No matter how many thousands of reactions a human or animal is capable of performing, there is always some stimulus or object in the environment which will arouse each of these reactions in him. Our search in the laboratory at the present time lies in this direction, to get a better knowledge of the stimuli calling out reactions.

With this data well in hand, it is a simple enough matter then to arrange the environment, put the necessary group of stimuli in front of him, to get man or animal to perform any act in his repertoire. Let us go into the human realm. I wish to make a seventy-day-old child blink. What stimulus shall I apply? I can touch its eyeball and produce the blink; I can blow on its eyeball and produce the blink; I can pass a rapid shadow over the eye and produce the blink. In other words, there are three stimuli which will call out this reaction. Suppose I wish to make a baby cry. We will assume that the baby has not as yet put on any habits, learned anything. I can pinch him, cut him, burn him, or apply any other noxious stimuli to make him cry. Suppose I wish to make a twenty-day-old baby smile. I find that the only way is to touch its lips gently, with a feather for example, stroke its skin gently, especially in certain sensitive areas.

But the problem is not always so simple. Many objects will not at first serve as stimuli for calling out a particular form of reaction. Some, indeed, will not at first produce any observable overt reaction. The individual must first be *conditioned* to these stimuli. Environment does the conditioning. The process is quite simple. For example, the first sight of a stick will not cause a youngster to dodge when he sees it. He must be struck (fundamental stimulus) before he dodges. If now I strike his

head sharply each time he sees me pick up the stick, he soon dodges the instant he catches *sight* (conditioned stimulus) of it in my hand. I have set up a *conditional visual response.* No "association of ideas" is involved because we can set up similar conditioned responses in our glands over which we have no "control." We can set them up even in the newborn infant; we can establish them in animals—even in the lowly one-cell animals.

Throughout life, objects which have no *kick* (that is, which are not stimuli to certain responses) are constantly borrowing a kick (becoming conditioned stimuli) because they happen to be present when some fundamental stimulus is calling out a reaction from the organism. This is why any object in the world, given the proper history in our past, can arouse a fear reaction. This is why any object or person in the world can be made to call out a love response—even a hunchbacked and disfigured woman of forty evoking such a response in a handsome lad of twenty.

To control the individual then—have him behave as society specifies—by confronting him with appropriate stimuli, we must have considerable knowledge not only about native, fundamental stimuli, but also about those which have been *conditioned.* To gain this knowledge, we must go to the laboratory and study the human individual from infancy onward.

III

This description serves to locate some of our elementary but basal problems. Having solved these problems, we hope to reach such proficiency in our science that we can build any man, starting at birth, into any kind of social or a-social being upon order. On the other hand, we hope some day to attain such proficiency that we can take the worst adult social failure (provided he is biologically sound), pull him apart, psychologically speaking, and give him a new set of works.

Is this goal too ambitious—is it totally unrealizable? Certainly in adults the goal is still far, far off. Yet we have not lost hope. The difficulty of working with the adult on a behavioristic basis is probably the reason the behaviorist has pursued his studies upon infants and young children so assiduously. Conditions are simpler there.

Hundreds of infants have been under the observation of the behaviorist, but unfortunately not for a sufficient length of time to reveal many of the needed facts. Rich material, however, has grown out of these studies, material which will ultimately give the key to the "control" of adult human behavior.

We can now determine with some accuracy what newborn infants can do. We know the stimuli which will call out their responses. We have something of a pic-

ture, too, of what the infant can do at three months of age, at six months, at nine months, at twelve months, and we have a pretty fair picture of how much of this behavior is *born* in and how much of it is *conditioned*.

One startling conclusion seems forced upon us from this study of the first year or two of infancy: The young of the human species perform very much fewer *untutored* (instinctive) acts than anybody had hitherto supposed. The other most interesting fact is that they begin to *learn* to do things—that is, become conditioned—the day they are born.

The question of instincts in man, we shall deal with in Chapter II.

CHAPTER II

WHY THE BEHAVIORIST HAS NO INSTINCT

WHAT is the truth about instincts? Do humans have them or don't they?

The view most widely held to-day goes back to Darwin. Since man and the lower animals have had a common *descent* they must be a lot alike. We see the beaver, even at a youthful age, gnawing down trees and constructing a dam. We see young birds mated for the first time and without previous experience building a nest of the same material and according to the same general plan as their parents. We see young dogs six months of age swim when dropped into water for the first time, as though they had had special training. We find young ducks and geese at home in the water after the first few minutes; but young chicks, although they stay on top for a short time, soon become water logged and sink. There seems to be almost no limit to the number of examples of so-called *instincts* in animals lower than man.

Now, since man has had an evolutionary history, we would expect to find in him any number of instincts sim-

ilar in many respects to those we find in animals. The *a priori* ground is strong.

William James crystallized the whole thing for us. Looking over the behavior of adults and young children, he finally arrived at a list of human instincts. This is his list—climbing, imitation, emulation, rivalry, pugnacity, anger, resentment, sympathy, hunting, fear, appropriation, acquisitiveness, kleptomania, constructiveness, play, curiosity, sociability, shyness, cleanliness, modesty, shame, love, jealousy, parental love.

The notion that man has instincts similar to those of animals fits in with the Darwinian theory quite closely. It did not occur to Darwin and James that the actual facts could be different and at the same time offer no difficulties to the Darwinian theory of descent. To-day every biologist and every behaviorist believes in descent—believes that man has had a long evolutionary history that started with the beginnings of organic life—no one liberally educated to-day believes that man was a special creation. Just how the family history tree will finally be worked out is possibly not yet clear, but the admission of complete belief in descent does not commit us in any way on the subject of the inheritance which will belong to each new variant from the parent stock. Suppose our nearest phylogenetic ancestor were the monkey. Until the variant man appeared no one could have predicted what his hereditary equipment would be like. Suppose the

evolutionary process is still not complete—suppose that through some chain of biological factors man should become once more a mutating stock and should suddenly throw a variant with *wings*. No one could predict what the birth equipment of this bird-man (*homo-ornithos*) would be like. No matter what his birth equipment should turn out to be, it would not alter the fact that he descended from man just as man has descended from some more primitive stock.

Now, all this has bearing upon the instincts of the 1928 man. Just because he has had an evolutionary history is no proof that he must have instincts like the stock from which he sprang—assuming for the moment that animals have instincts. *Only daily observation* upon the new-born infant and the continuation of these observations during the early years of childhood will enable us to decide whether man has more instincts than brutes, fewer instincts than brutes, or no instincts at all. Darwin and James had no real data upon which to base their conclusions.

But this is not the whole story of the prevailing theory of instincts. Man not only has a body—he has a "mind," so the biologists assert. If his body has had an evolutionary history, so also has his mind. We should expect, then, from this view, to see in humans "mental" traits like those in animals. Our literature is full of such allusions. Man's mind has the "cunning of the brute" and

the "slyness of a fox." His mind is brutal—cruel, ferocious—all such allusions show our mental kinship with the brute stock from which we sprang.

And, furthermore, if we inherit many of our mental traits from our primitive brute ancestors, how much more close is the inheritance from our human fathers and grandfathers? Reasoning thus by analogy, both biologists and laymen have built up a seemingly incontrovertible argument for the inheritance of so-called mental factors and potentialities, "His talent was inherited from his gifted father!"—"He is a statesman coming from a long line of statesmen."—"His musical ability was inherited from his mother." How often we hear it! The inheritance of "disposition"—"talent"—"special abilities"—"mental alertness"—"temperament."

The belief in instincts and in inheritance of mental traits in man has been strengthened in the popular view by the propaganda of the eugenists. They have made many observations upon gifted families and they conclude from their findings that "talent" does run in families—that such things as mathematical ability, musical ability, and artistic and literary ability are handed down from parents to children. They go further and hold out the hopes that by intermarriage of the gifted we can finally build a race of Nietzscheans—only these supermen and superwomen will be bred for art, industry, and science, and not for war. This view of the eugenist will ulti-

mately tamper with the mating of men and women and is more dangerous than bolshevism.

Based upon the belief in the inheritance of family traits, we have built up for ourselves—we fortunate ones (!)—a pretty world of F. F. V.'s—my family; my ancestry; my Nordic blood; of superior and inferior races. We like to view the world through these rose-colored glasses if we happen to be allowed to wear them —nor are we especially grateful to the one who changes the color of our lenses.

This belief in heredity of traits and capabilities has become a part of our mores—ground into every generation by family and religious training. It is a device which enables us to shut our eyes to the present and to our responsibility for the present. It is a clever but unverbalized device (the Freudians would call it unconscious) for living forever (p. 97). It is hard for most of us to believe when we are dead that we are dead all over, like Rover. Some of us may boast of the fact that we are irreligious and even claim that we do not believe in a life after death—but we soothe the personal hurt of this by believing and teaching that we as individuals will carry on in our children just as our parents have carried on in us. Our traits, our emotional equipment, our vocational equipment, we believe find expression in the lives of our children. We hate to give up. We hate to die. We can't believe there will ever come a time when our im-

press is lost to the world. Such an attitude finds full expression in a headline to an advertisement I once saw—"Why does every father hope that his first-born will be a son?"—or in the law of primogeniture in European countries. This law is at heart partly a psychological law and does not depend wholly upon property and succession to title. Psychologically it means that my first-born will be born when I am young and lusty—when I am in full possession of all my perfections. Therefore, he, above all the children which I may beget in my later years when my powers may have waned, will be endowed with all my characteristic and perfected talents.

Another thing this belief does for us. If we have had children and failed with them as most of us have, it provides us with an escape. If the "bad" child has inherited all these things from his mother's family (as the husband, seeking to clear his side of the family, will assert) why should the husband be blamed? It is just nature, and nature is so much stronger than nurture!

This, stripped of its unessentials, is the reason for our unbounded belief in the inheritance of "mental traits," "dispositions," "capabilities," "tendencies," and "special abilities."

THE THESIS OF THE BEHAVIORIST

Now what are some of the unpleasant facts the behaviorist believes he has uncovered?

The behaviorist finds that the human being at birth is a very lowly piece of unformed protoplasm, ready to be shaped by any family in whose care it is first placed. This piece of protoplasm breathes, makes babbling, gurgling, cooing sounds with its vocal mechanisms, slaps its arms and legs about, moves its arms and toes, cries, excretes through the skin and other organs the waste matter from its food. In short it squirms (*responds*) when environment (inside or out) attacks it (*stimulates* it). This is the solid observational rock upon which the behaviorist's view is founded. He says, "I find none of the instincts listed by James."

The eugenist, the biologist, and the old-time psychologist say: "Yes, yes, but you have observed the child only for the first two or three years of infancy. Most of these instincts, all the traits and inherited talents and capabilities, show up at a later age." The behaviorist retorts: "Well, if I have observed them only for the first years of infancy, that is just so much longer than you have observed them—you have never observed them at all. Consequently, the burden of proof rests upon you. You must at least go back to infancy to find out of what the material that you are going later to observe, is made up."

And this is the whole point: *conditioning—nurture not* nature—starts so early that the biologist and the eugenist have had no opportunity to make valid observations.

The behaviorist cannot doubt that the first two years of infancy are enormously important in shaping the child. If no record of the first two years of infancy has been kept, scientific observation is impossible. Every biologist knows how impossible it was to make accurate observations upon Burbank's plant material—it was all too mixed up—too many things had been done to it which were not accurately recorded. Trying to observe a human child two years of age whose daily record was not kept is like trying to figure out the family history of a new variety of primrose by looking merely at the flower. By the end of his second year the child's temper is well organized; his vocational slants, his character, his fears, his positive bent toward things—toward pencil, paper, chalk, carpentry, water, social relations—have been so slanted that only a divine being could unmake him and give him over to the biologist as new material fit to watch for the unfolding of family traits.

So when the experimental evolutionist and the mental testers—the latter are even predicting the future genius on the basis of the six-year-old test—tell us that their studies of gifted families show that "gifts" are handed on to children in a greater percentage than the laws of chance would call for, the behaviorist laughs. He sees in their claims only a perfect proof of his own theories. For where but in a musical family would the young infant get the pattern responses for becoming musical? Where

but in the family of the architect would the infant get those early slants that would make for architecture? Where but in the family of the neurotic and psychopathological would the youngster of four learn to say, "I have been coughing all night. I feel sick and I don't think I ought to go to school to-day"? And where but in the family of the artist would he get training in the handling of color, size, shape of objects, and the neurotic training that goes into the make-up of the artist (the latter by no means a necessary part of his equipment)?

But why are only some of the children of the gifted gifted? The reasons are not far to seek. I often talk to artists about this. "My daughter, who looks like me, has a marvelous sense of rhythm and proportion; she started early to show this. She really did good things when she was four. She even moves objects around the room in the same jerky way I do. I've never tried to teach her anything. You can't make me believe she hasn't inherited something (!) of my gift and talent. My son, who looks like his mother, won't touch a brush or pencil; he hasn't a single movement like mine and yet they have grown up in the same environment." It is unkind to tell this artist that he has a strong fixation on his daughter; that almost from infancy he has found (or better, built up) in her what he has not found in his wife; that his wife hates his profession and by hook and

by crook will die before she will see the son follow in the footprints of her husband.

Is there nothing, then, in heredity? How absurd! Certainly there is. We are born men, not kangaroos. We are born with two eyes situated close together, not like fowls and horses, where the two eyes, except for a narrow range, never view the same object at the same time. We have two arms, two legs, ten fingers, and ten toes. Because of this structure there are some things we can more easily learn to do than can other animals. Our fingers are more mobile than our toes. We learn to do things with fingers rather than with toes for no other reason. If we are unlucky enough to be born without fingers, we learn to write, pound a typewriter, and to draw with our toes. If we are unlucky enough to be born with only one arm, we can never learn to be ambidextrous. If we are born without certain chemical constituents in our retinas, we can never learn to react to monochromatic lights (make responses to different colors). If we are born with certain deficiencies in our ears, we may never react to different wave lengths in the air (tone deaf, tone islands, etc.). If we are born without eyes, we can't react visually. If we are born without certain brain equipment, we may not be able to learn even the simple acts of caring for ourselves (so-called defectives).

The behaviorist admits all this, but he says that, contrasted with what the human infant has to learn (be

conditioned to), it is all-*unimportant*. Take any new-born American youngster and transport him into the interior of China and give him over to the exclusive care of a Chinese family and he will develop flawless Chinese, wear a queue, worship his ancestors, eat with a chop-stick, sit on a mat. He will learn the Chinese scale of music (very different from our own, since they have a smaller number of notes than we have), develop rhythms and accents in music very different from those we have in the West. What has become of his Western trait inheritances from his jazz-proficient piano-playing mother and from his cubist modernist-in-art father? Gone like the snows of yesteryear. His behavior, his capabilities, what he will do, will be determined by his family life—by the patterns he finds there, by the accident of that environment, and by the special emotional fixation of the one or the other of his (adopted) parents.

The behaviorist is a matter-of-fact, common-sense kind of fellow. He asks us to come back to earth and to the child as he is.

On the basis of his experiments, he argues somewhat as follows: "I find that I can take these squirmings of the new-born—his unorganized finger movements, the movements of his arms, legs, feet, and toes, the squirmings in his trunk—and weave them into highly complicated acts of sport, of skill, such as driving a nail with a hammer, carving with a knife, shooting with bow and arrow, or

tennis-playing, climbing, crawling, running, and walking. I can take the squirmings of the throat muscles and weave them into those highly organized acts we call talking and singing (and, yes, even thinking). I can take the infantile squirmings of the gut—the unstriped muscular tissue of the alimentary tract, diaphragm, heart, respiration, etc., and actually organize them into complicated emotional responses we call fears, loves, and rages."

The behaviorist asks for nothing to start with in building a human being but the squirmings everyone can see in the new-born infant.

He goes even further and says: "Give me just one hundred 'squirmings'—of fingers, hands, legs, toes, and trunk—and let me tie them together by my methods and I shall have more than enough." And here he calls our attention to a very simple rule in arithmetic. How much is *factorial* 4? Why, it is $4 \times 3 \times 2 \times 1 = 24$. Now since he can combine the hundred squirmings in as many ways as he pleases, the total number of such combinations of possible responses will be factorial 100. Have you ever tried to work out factorial 100? Well, it is a colossal, stupendous number. If any human being possessed factorial 100 responses, he would have so many that he could not run through his repertoire of responses if he lived to be as old as Methuselah. Take language, for example—you think you use almost a limitless number

of words. As a matter of fact, few of us adults use more than 18,000 words. Most of us get along on less than 2,000, many get along on 500—800 words. Society in America as we have it to-day calls upon us to possess such a simple set of adjustments. Our accomplishments, even our words and sentences, are so limited and stereotyped that you can pretty well predict what the majority of men and women are going to say and do in most situations. We are so stupidly uninteresting. We stop the organizing of these squirmings just as soon as we can get along in the group we live with—just as soon as we can earn some kind of living in this land of milk and honey where a living is so pitifully easy to obtain.

If the world were to be covered with water to a depth of six feet and all tools and lumber were cleared away, we should soon organize our latent squirmings into climbing, and from climbing to hopping and swinging from branch to branch in trees (assuming that there were trees). Think how quickly our vocational and emotional equipment would change. There is no mystery in building the human being into as complicated an organism as he is—the mystery is that we let him go on living with the simple set of responses he has when he has within him (no miracle stuff!) such possibilities for greater organization. That is one of my quarrels with society. We let the individual stop at the 12 × 12 multiplication table.

We let him get away with rotten tennis, unscientific and unsound business methods; with conversation at the level of a moron. There used to be a guild system where perfection of hand and finger responses was called for almost up to the physiological limit of the individual's ability. Think of the tapestry that used to be woven, of the fine laces that used to be made, of the carvings that even the boys could make. And in the vocal field remember that once every troubadour was a virtuoso. This is not a cry for the good old days. It is not a wail that we have degenerated in eye, hand, and muscle. Not at all; the stuff is there crying to be whipped into shape. It is a cry for getting into the environment some kind of shock or punishment that will force all of us to develop to the limit of our capabilities. I have an undying respect for what we can do with that squirming mass of protoplasm we call the human infant.

Only in one field do we keep the guild spirit, and that is in science. There Herculean tasks are done and every generation sees finer and finer technique, greater and greater skill in the control of eye and hand.

In short, the cry of the behaviorist is, "Give me the baby and my world to bring it up in and I'll make it crawl and walk; I'll make it climb and use its hands in constructing buildings of stone or wood; I'll make it a thief, a gunman, or a dope fiend. The possibility of shaping in

any direction is almost endless. Even gross differences in anatomical structure limit us far less than you may think. Take away man's hands and I will make him write, use a typewriter, drive an automobile, paint, and draw with his toes. Cut off his legs and paralyze his trunk muscles so that he will be bedridden, but give me only his hands and arms, and I'll have him playing the violin, writing, and doing a thousand other things. Make him blind and he can still play ice hockey, shoot with some degree of skill, read and write, model, and earn his living in a hundred different ways. Rob him of his ear at birth and I can teach him to carry on a conversation with you by watching you speak. Make him a deaf mute and I will still build you a Helen Keller."

With these facts before us we have the answer to the oft-reiterated assertions of the eugenists, that since measurements show that there are slight differences in body and brain structure between individuals, these anatomical differences must make a difference in the way the new-born starts out. No, the burden of proof is on the other shoulder. In the light of what we know we can do with the human infant (and undo and spoil) at an early age, we are no longer willing to admit that these slight anatomical differences are effectively utilized in habit formation. The belief in inborn instincts and inborn mental traits, dispositions, capabilities, tendencies, constitution, now needs facts to substantiate it.

HOW SOME OBJECTIONS ARE MET

Numerous objections are raised against the behaviorist's view that men are built, not born. The first is: "Here are two children born and brought up in the same environment, by the same parents, surrounded by the same neighbors. They eat the same food and dress in the same kind of clothes. Their capabilities, talents, dispositions, bents, and slants are totally different. How do you account for this? There must be something in heredity, after all." Let us take an actual case: Here are two brothers living in the same home, only a year or two difference in age, born to parents sophisticated in child nurture. They are treated as nearly alike as possible. One gets tonsilitis, has numerous colds, has to stay in bed frequently, finally has to have his tonsils out and a birth mark removed. He goes to the hospital, sees the nurses in white, hears a man called "doctor." He has to undergo an operation under ether. For months and months the sight of a woman in white terrorizes him; anyone called a doctor coming into the room raises a cry. Here are two little girls brought up in the same home, having the same environment. One at the age of six receives a sex shock that conditions her against boys and men for months and possibly for life.

Fathers and mothers cannot react to two children alike; they cannot treat the second child like the first-

born. Identical twins almost indistinguishable by sight or voice come the nearest to having the same environment. Unless an accident such as an illness occurs to one and not the other, they will show closely similar behavior. But if the children are separated at an early age and brought up in widely different homes, their organization is widely different. The same-environment-but-different-traits objection breaks down because there is no such thing as same environment.

Another argument often advanced as an annihilating one is that there is such a thing as an inferior race. "You have to admit," say its proponents (who include many biologists), "that the Southern negro coming out of darkest Africa and falling under the influence of the cultured Southerner showed no rapid steps in the putting on of culture; surely here the influence of heredity shows up. The negro is an inferior race and will always remain one." Many of us now realize that this is a completely unproved statement. The negro has never been given a chance to develop. If you sent each and every negro to Harvard and then through law and medicine and gave him a year for travel and a million-dollar-a-year income, he would still not have an equal chance. Even in Boston or in Washington the negro would still be a negro; he would still be made to feel his inferiority. There is a sporadic attempt in New York on the part of a sophisticated group to lionize the negro. They go to the Harlem night clubs,

eat and drink with him on a plane of social equality, ask him to their homes, and in general wine and dine him. But let one negro try to marry a son or daughter of any member of this clique, and the devil's to pay. In Jamaica and on the Continent there is less of the social barrier and the negro consequently has more nearly an equal chance with the white. Why, then, didn't he develop in Africa where he was king? Because where food, sex, and shelter offer no problems there is nothing in the environment to force the trial-and-error movements that lead to discovery. Even white races dwelling in the tropics slow down.

This argument is varied somewhat by certain biologists when they begin to argue for the difference in brain weight between the cultured European and the savage. The truth is that, regardless of status of culture, brain weight is proportional to body weight. The savage has a small brain weight because he has a small body. The cultured European woman has about the same brain weight as the Australian bushman because on the average she has the same body weight. She has a smaller brain weight than her lord, not because she has any less "intelligence" than he has, but because her body is smaller.

HOW THE BEHAVIORIST BUILDS IN RESPONSE

Since the behaviorist doesn't believe in instincts, what does he put in their place? How does he bring about

organization in the simple squirmings of the infant? He does it by *conditioning*. Let us use some homely illustrations. One of the squirmings of the new-born brings its finger to its mouth (many youngsters suck their fingers almost from the moment of birth). Rap his fingers with a pencil each time he puts his finger in his mouth. Soon the mere sight of the moving pencil makes him draw back his hand; a little later the mere sight of the individual who always raps him will cause him to pull his finger from his mouth. This modification of behavior we call a *conditioned visual response*. The sight of the pencil and the sight of the experimenter's face at first called out *no response*, were not stimuli. By this simple procedure we have made the mere sight of the pencil and the mere sight of the experimenter's face call out the same response as hitting with the pencil. Take the child's breathing—surely this is an unchanging, steady, physiological reflex? Not at all. Show the infant a red apple; it does not affect his breathing. How can I make the apple profoundly modify his breathing? A slap on the wrist from birth does cause a marked variation in breathing. Now if I show the red apple at the instant I slap him on the wrist, the red apple soon causes the same change in the rhythm of breathing as does the slap on the wrist. Again we have built up a *conditioned* visual response. A visual object that had no kick has been provided with one.

Every object in the universe thus becomes loaded or charged, as it were, by conditioning.

Without going into detail we may say, by stretching our imagination a bit, that we can take any object in the universe (including words) and make the infant flex his arm at the elbow every time that object is shown. We can take any object in the universe and make him clench his fist every time he sees it. By showing the objects serially (spacing and timing) we cause the child to display his responses in series. We call this an "act." Think of a group of soldiers under commands: 1. Right front into line. 2. March. Each movement in this complicated series of acts is a conditioned response built in just like the ones we build in the infant to enable it to manipulate its milk bottle, toys, etc. *This conditioning goes on rapidly* from the moment of birth. Conditioned the child becomes almost at once to the bottle, to the mother's voice and footstep; the harsher touch of the father and to his louder voice; to the way he is dressed and laid in his cradle; to the light in his room. Condition a nine-months'-old by letting him have a toy to take to bed. Neglect to hand this to him some night and you'll hear from him. Condition him to sleep with the light on, and some night turn it off. Let some one besides his mother hold and feed and dress him and you'll see how the cement is beginning to set. By the end of a year he is almost adamant along the lines in which you have

conditioned him. With me my four-year-old is a boat-builder and an athlete, proudly displaying his muscle, his chest, and his ability to box; with the gardener a gardener; with his mother an automobile driver, a reader of books; with his nurse a chatterer of French; with his six-year-old bicycle-riding brother he is a kiddie-car expert.

If you haven't had experience with conditioning infants, it is difficult to realize how quickly the protoplasmic material gets fixed.

Now isn't all this far better and more thrilling than instincts? Is the behaviorist going to tear down the world by finding that, instead of instincts in the child which are irrevocable and beyond our control, he has limitless plasticity at the start? Doesn't it give every parent, every potential parent, a kind of open as well as secret exhilaration to learn that his child does not have to carry along many of the weaknesses and inferiorities he possesses? Doesn't it give every man and woman who has failed and who has attributed that failure to faulty inheritance or "fundamental constitution" a thought that possibly his or her own efforts have in the past not been quite vigorous enough?

And doesn't it make all of us responsible in a way for failures in society, for our criminals, our drug fiends, and for the ignorance and stupidity of the masses?

The behaviorist is a mechanist? Yes, utterly. But is

not one piece of iron shaped to become an automobile axle, another to become the essential parts of a scientific instrument? Isn't one piece of rubber shaped into a tire, another into a tube, and isn't it man's hands that do the shaping? Is there anything especially revolting in believing that man's hands can take the living protoplasmic mass we call the child and shape it according to the specification demanded by our present social standards? I can't see the difficulty. No, the only hopeless and downright dangerous mechanists are the predestinarians and propagandists for the inheritance through endless ages of "mental traits."

We shall try to apply in the next chapter a bit of this same logic to our emotional behavior.

CHAPTER III

THE BEHAVIOR OF THE GUT—A STUDY IN HUMAN EMOTIONS

THE ancients held the view that, while the head was the seat of the intellect, the heart was the seat of the emotions.

If we make heart include our whole "insides," this old view is strangely like our modern behavioristic view.

The good old Anglo-Saxon word *guts* is one of the simplest terms to designate that portion of our anatomy that moves, behaves, responds to emotional stimuli. The Latin word *viscera* is a bit more polite but less forceful.

Our viscera, or guts, are our stomach and intestines; our lungs with the diaphragm and windpipe; our heart with its appendages such as the arteries and veins. These organs all contain *unstriped or smooth muscles* (in contrast to the big red striped muscles of our legs, arms, and trunk) which contract and relax. Our visceral organs are all under *tension*. This tension can be increased or decreased. Many of these organs are hollow. They open or close under varying muscular tension. Then, too, there are duct glands (composed of secreting cells,

blood vessels and other unstriped muscular tissue). These glands secrete. Good examples are the salivary glands. The lachrymal or tear glands, the stomach glands, the sweat glands, and the sex glands. There are ductless glands, too, which pour powerful chemical substances (hormones) into the blood stream. Each hair is supplied with a tiny muscle. When it contracts it causes the hair to stand erect. Truly in the gut we have a wealth of tissue which can behave in its own way when the appropriate stimulus is at hand.

But do not all these processes work smoothly—quite automatically? Do they not make up the so-called autonomic system and are they not controlled by an almost independent division of the nervous system?

The answer to each of these questions is "yes." Under ordinary circumstances the visceral organs work quietly without a hitch. We eat food. Immediately the salivary glands begin to flow, helping us to swallow our food and partly to digest it. When the food reaches the stomach, other glands begin to function—absorption takes place; our circulation and respiration go quietly on. Our sweat glands become active in hot weather, cooling the surface of the body and throwing off waste products. This whole visceral system when it works well is a beautiful study in bodily mechanics. It seems so primitive and stanch that nothing short of an earthquake could upset it.

What does upset it? Strange to say, it is the most

easily upset system imaginable. After we pass through bad childhood training and a worse adolescence and reach adulthood, it becomes tricky and undependable. A bit of bad news can wholly stop the digestion of food. The hooting of an owl in a tree near your window at night can slow down your breathing for a time, bring pallor to the face, alter profoundly, possibly for hours, your whole internal machinery. The sight of a snake can so paralyze the beholder that neither speech nor flight is possible. It is said that eight people died while listening in over the radio at the Tunney-Dempsey fight. Of course, these people were not organically sound, but they might have lasted another score of years if they had not put their guts to the strains of reacting to such a powerful emotional stimulus.

Thousands of home situations—verbal tilts between husband and wife, between child and parent, brothers and sisters, sweethearts and lovers—get the visceral systems so tied up in knots that they cannot work. Gloominess, despondency, shyness, joyousness, exaltation (there are thousands of others) are the names we give to emotional responses called out by such stimuli.

No wonder the introspective psychologist gave up the problem of experimenting with emotional behavior and became content to spin verbal formulations. He might as well have tried to catch the changing scenes in a kaleidoscope or the shift of colors on a Maine coast

at sunset as to try to lay verbal hold of the "stuff" emotions are made of. The mistake the psychologists made —William James included—was to look upon emotions as "mental states" and not as *ways of behavior which had to be learned like other sets of habits.*

Most of us, when we think of *learning,* think of the organized movements we make with our arms, legs, trunk, neck (including speech). But this organized behavior, inculcated from the kindergarten on, is due primarily to the action of the big red striped muscles which bulk so largely in our own arms and legs and trunk. Until recently it has been the only kind of learned behavior we knew much about. Society very early got our striped muscles under its control. We were taught to dance, to walk, to sing and pray—to acquire acts of skill both for working and for getting out of the way of work. Society has taught reading and writing and arithmetic—and Heaven knows what else—to our striped muscles.

But striped-muscle behavior is not the whole of behavior. Sometimes it is far from being the important or major part of behavior. We may earn our bread with our striped muscles, but we win our happiness (which I insist is, in behavioristic terms, only a mode of behavior) or lose it by the kind of behavior our unstriped muscles or guts lead us into.

It is strange that we have lived through so many

millions of years and have never learned how to educate or organize our emotional life. But such is the case. It is the one realm that has baffled social control. We hear of no technique for learning how to behave emotionally or unemotionally. Anybody can teach you to play tennis, drive a motor car, set type, to paint or to draw. We have schools and instructors for all this, but who has set up a school for teaching us to be afraid and not afraid, to fall in love and to fall out of love, to be jealous or not jealous, to be slow to anger and quick to forget, not to harbor resentment, not to let the sun go down on our wrath, to forgive freely, not to give way to angry passions? And yet some of these modes of behavior make up the essence of the so-called Christian religion; as a matter of fact, they are a part of every civilized code. Outside of a few inert, verbal mandates—"control yourself," "don't be afraid"—no technique is offered by Bible, Koran, ethics, or current psychology for getting a grip upon our own emotional behavior or for instructing the gut of the youth to behave according to a standard social pattern. Emotional behavior has been learned under chaotic conditions. Only by luck do we get our emotional life organized and when we do we cannot show anyone else how we did it. The psychoanalysts have made some bold claims about emotional control, but strict analysis along Freudian lines has not been very success-

ful. It is but another hit-and-miss method—a trick or device rather than a scientific method.

As a consequence of all this the head (segment of the body) may dominate the way our arms, legs, and trunk behave, but it can issue no orders to our guts. The head may say: "Arm, fly up," "Legs, bend at the knee," "Feet move swiftly," and the orders are executed. How futile for the head to say to the salivary glands, "secrete"; to the sudorific glands, "pour out sweat"; to the lachrymal glands, "stop secreting tears"! How childish, then, the command of the poet, "Be still, sad heart, and cease repining." How ineffective the preacher's platitudes to the grief-stricken mother.

We are not the creatures of reason we think we are. Even the most austere are, on the contrary, creatures of steel-riveted emotional systems. After acting under the sway of our viscera we often "rationalize" our actions to conceal our weakness. "I took pity on him; I had to give him something." "The child was crying as if his heart would break; I didn't have the heart to punish him." "He was so bold in his love-making, I was afraid he would become violent if I repulsed him." "I couldn't stand it. I had to give in on the quarrel with my parents. I can't bear a fuss"—and thousands of other expressions are but the verbal front with which we cover up the fact that our guts control our actions. Creatures of reason—not at all! The heart in devious ways manages always

to steal a march upon the head. The Biblical chronicler was ahead of his time when he said, "Keep thy heart with all diligence; for out of it *are* the issues of life."

CAN THE GUTS BE TAUGHT?

The psychological laboratories for years have studied the formation of general bodily habits (involving the red or striped muscles) such as the acquisition of skill in telegraphy, typewriting, keeping two or more balls in the air, archery, gunnery, multiplication, addition, and the like. These experiments have produced results which are of practical value in the control of habit formation.

Pawlow first pointed the way to the control of the gut through conditioning or habit. His experiments were carried out upon the salivary glands of the dog. It remained for Dr. K. S. Lashley, working in the Hopkins laboratory, to apply these experiments to the human being. He built a very ingenious apparatus for studying the human salivary gland. It was made of silver, about the diameter of a nickel and about one-eighth inch thick. It had two compartments, one of these fitted over the opening of the salivary gland in the cheek. A slender silver tube led from this compartment out through the mouth. The other compartment was connected to a small air pump. By exhausting the air the apparatus was made to cling comfortably to the cheek. After the ap-

paratus was attached the saliva passed out through the mouth tube drop by drop. Each drop was counted and timed. Ordinarily, when not especially stimulated about two drops per minute appeared. How can we from birth make this gland secrete more rapidly? What is the natural (unlearned) stimulus to which it reacts? The *unconditioned* stimulus is a weak *acid*—weak hydrochloric or plain vinegar. When this is applied to the tongue with a common medicine dropper the saliva pours out at the rate of twenty to forty drops per minute (*unconditioned response*). What happens if you continue this experiment for a short time? *The salivary gland begins to pour out its secretion the moment the medicine dropper is shown to the subject. You no longer have to stimulate the tongue with the acid.* You have established a *conditioned glandular response.* Incidentally, you have won your first (experimentally produced) mastery over the human gut. You have taught it a *habit.* "Association of ideas" (that old meaningless phrase) you say! Not at all. Even after your salivary gland has been taught this trick, try by every known "power of will" (another meaningless phrase) to make the gland secrete faster or slower. The head (verbal commands) cannot make the gland change its regular rhythm. No; to "control" it you have to be thrown back into the old situation, namely be at ease in your chair and have a pipette suddenly shown you. Immediately the gland begins to flow. And

in a nutshell this is the whole theory of emotion. There is no rhyme or reason about it. Accidentally, through family tradition, accidents of routine, etc., the gut gets conditioned. You can't argue about it, your "will" won't function on it, but when thrown into the old situation the old emotional reaction takes place.

Cason has shown that the pupil of the eye (another gut element) can be conditioned in the same way to the sound of a bell. Pawlow, Anrep, and many others have shown that the glands of the stomach can be conditioned in similar ways. Now we begin to understand why every kid's mouth waters when he passes a bakery shop, why the sight of a well-ordered dining room aids digestion, why our food and dining room should be made attractive, why fusses should be undertaken only after digestion is complete. It is probable that every gland in the body—both duct glands and endocrine—are shot through with such conditionings. We have many experiments which show that our stomach, heart, and respiratory systems are encumbered with such habit systems.

THE GENESIS OF EMOTIONAL BEHAVIOR

Methods such as I have just described give us control of the viscera organ by organ. They are strictly laboratory experiments. They give us only slight help in handling the everyday problems of emotional behavior in our

children, in our patients, and in ourselves. It was this need that brought us at the Hopkins laboratory to the study of the origin and growth of emotional patterns of behavior in children from birth until the main emotional habits are set—an age I place at two years or younger.

What are the *unconditioned* stimuli (situations) which will arouse *unconditioned* gut reaction patterns in the new-born (unlearned behavior)? Are the situations numerous and are the patterns of reaction varied and complex? And given the answer to the number and kinds of reactions we find at birth, and given the situations which call out these reactions in advance of all training, how does our emotional life get more complicated? Finally, after it has become complicated, can we devise methods for unconditioning or removing emotional responses? These were the problems that engaged us at Hopkins, where several hundred infants were placed at our disposal.

We began our work by putting the baby through hundreds of situations which we know from observing adults will often arouse emotional behavior. Place the new-born in darkness, flash a beam of strong light across its eyes. Show it many different forms of animals, furry, cold, wet, slimy, feathery, fishy, all that you can find around the home, laboratory, or zoo. Then try another set of situations. Hold its head between your hands, clamp its knees together, hold its hands firmly but gently

to its side. Let it grasp a pencil and then suspend it in the air over a pillow for a moment or two. Jerk the blanket upon which it is sleeping. Try still another set of situations. Rock it, pat it, stroke its skin, kiss it, joggle it gently upon your knee. Do all this at birth, at two weeks of age, at one month, at three months, being careful that you know everything that has happened to the infant during this time.

Slowly certain facts seem to emerge; our experiments are yet all too few and too few investigators have repeated them for scientific certainty.

(1) Apparently only two stimuli will call out that pattern of behavior we call a fear response. One is a *loud sound,* the other is *loss of support.* The banging of a dishpan, the shrill vibrations of a steel bar, the sudden slamming of a door, are the kinds of sounds most effective. The other type of stimulus, loss of support, is best shown when you jerk the blanket of a dozing or quiet infant. The first time the young child steps into deep water is another good situation. The obvious easily observable reaction is a sudden catching of the breathing, marked changes in heartbeat and respiratory rhythm, crying, throwing upward of hands. While the deep-seated bodily reactions (gut changes) are profound, the hand, leg, arm, and trunk movement (striped-muscle participation) are simple and easily observed.

We might write this down as a formula:

Unconditioned Stimuli—call out Unconditioned Response	
Loud Sounds Loss of Support	Fear

We have never found any other stimulus that will call out fear in an unconditioned child. Children (unspoiled ones) are not afraid of the dark, of strong light, or furry animals, or slimy objects like snakes and frogs and fish and worms. When they show fear at any or all of these objects it is proof that the home has built them in.

(2) Hampering of the movements of a new-born or young child calls out the behavior pattern we call *rage*. Hold the head gently in one position, hold the arms to the sides or the feet close together, not violent enough to bruise or to call out a pain reaction; soon the body stiffens, the cry begins, louder and louder it grows; finally the mouth is opened as wide as possible, the face becomes black—again the visceral changes are violent. Our formula reads

Unconditioned Stimulus—calls out Unconditioned Response	
Hampering of bodily movement	Rage

(3) Stroking the skin anywhere, but especially around the lips, face, breast, and in the sex zone will produce a profound change. If the infant is crying, crying ceases, the smile begins, there comes a relaxation of bodily ten-

sion—in an older child, gurgles and coos. Our formula is

Unconditioned Stimulus—calls out Unconditioned Response	
Stroking contact of skin	Love

Emotional behavior, then, in the unconditioned child is apparently a very simple matter. Three rather marked ways of behaving in the presence of four general types of stimuli. Is this an over-simplification? Possibly, yet the work has been checked by several other investigators.

If this is all there is to early emotional behavior, how can we account for later complexity? How does it come about that we all soon become more or less the victims of our emotions? Does the emotional life become more complex in older children just of itself through "heredity"? This was the problem we next undertook to solve.

No previous experiments were at hand to guide us at this point. The thought of experimentally building in and tearing out emotional patterns had hardly ever been raised. Remembering Pawlow's work on conditioned responses, we asked ourselves the question: Can emotional responses involving the whole visceral system (and certainly the major emotions, fear, love and rage, do involve not only the viscera but the whole body) be conditioned? After some fruitless effort we hit upon a technique which gave us an answer to this question.

We select some animal or other object with which the child (any age) has been playing for some time—some neutral object like a toy or pet animal—which has never aroused any emotional reaction in the child. Next we allow an assistant to carry this object to the child, as usual, in a covered tray. The instant the object is uncovered and the child begins to reach for it a second assistant strikes briskly on a steel rod or dishpan behind the child's head. Instantly the child—let us say one nine months of age—stiffens, catches its breath, begins to cry, falls down and crawls away. We quiet the child, let it play with toys. We repeat the test. The same thing happens. After only a few tests we show the object but do not make the noise. *Instantly the child reacts to the neutral object exactly as it would react to the noise.* A conditioned emotional response has been established. Does it sound too simple to be the keynote of all our emotional troubles, too simple to account for all our adult fears, apprehensions, dreads, and misgivings? We feel quite sure now, after many other investigators have confirmed this work, that the simple process of conditioning is quite sufficient to account for the genesis and growth of all emotional complexity. The home is the laboratory where the complexity is built in. Doors slam, window shades fly up, dishes fall suddenly, dogs bark in the dead of night, the thunder cracks—there are hundreds of noise situations which can and do serve as con-

ditioning stimuli. This diagram may help to make the steps clearer.

Before Conditioning

Unconditioned Stimuli—call out Unconditioned Response

Only { Loud noises / Loss of support } — Fear

After Conditioning

Conditioned Stimuli—call out Unconditioned Response

Darkness
Sight of furry animals
Sight of family groups who cackle and laugh
Flash of lightning
Sight of moving toys
Sight of father (who storms at child)
Sight and touch of water (due to loss of support)
Sight of high place

} Fear

(The list is endless—not every child actually fears all of these things because the environment of each child is different)

Whenever an object (not a loud noise), through conditioning, gets to the point where it can arouse fear, it can then be used in the place of the loud noise for establishing other conditioned fear reactions (conditioned responses of the second order). This enormously increases the probability that a large number of conditioned fear responses will get set up under ordinary home conditions.

Conditioned rage and love responses grow up in the same simple way. The child gets attached to anyone or anything that strokes, pets, feeds, bathes, rocks, or pats it. The mother most frequently is the person who in-

dulges in such pastime, hence the child "loves" its mother. Soon the *sight* of the mother, the *sound* of her voice and footsteps, the *sight* of her picture or the *sight* of her clothes, or her sewing basket or even the printed word *mother,* is sufficient to call out the sentimental responses that go under the name "mother love." Later on, in the sophisticated, the *spoken* word *mother* or even the laryngeated (thought-of) word *mother* calls out the same sentimental pattern response—husky, hushed voice, weeping, etc. The fact that this same mother love is responsible for a large number of divorces, a large number of unhappy marriages, incapacity for work, dependency, invalidism, is not enough to keep the mothers from petting their children. Nor will they, when they read these laboratory tests, begin to treat their children —even their babies—as *persons* rather than as lapdogs and other pets and be content to have their children behave toward them as they do toward any other well-bred person. The behaviorists have been under constant fire from the mothers of the country for the past ten years for this rather simple analysis of love. "*Cruel, inhuman wretches* the behaviorists are—devoid of human feeling."

Our view, then, is that emotional behavior is very simple at first; by conditioning it becomes complex. The conditioning is harum-scarum, unwatched, unthought of in the home, hence our adult emotional behavior is harum-scarum, disorderly, and unpredictable. We even

partly excuse murder to-day on the grounds that the murderer acted in the heat of passion!

By the time adulthood comes, nearly every object in the universe is surcharged a bit with fire—has the power to stir up the gut. The "will," the "intellect," "pure reason"—they never had a chance; they are kept busy finding specious "explanations" for the ways our guts make us behave. The Puritans, the conventionals, and the religionists were conditioned back in the past eons against any display of emotions: an era of repression began which is not yet over, which will not be over so long as a formal church, school, university, law court, or prison stands. We are not ready to dispense with them overnight, but we are ready, it seems to me, to begin to take stock of such institutions. Since the gut cannot be legislated out of existence or repressed to ineffectiveness—since we must live with it, each with his own—why can't we train it or have it trained to behave in an orderly way, like the way the rest of our body behaves? Should our child fear some one or two things, then teach it to fear those things and no others. If the child should fear snakes, spiders, and airplanes, cannons, swords, sabers, and rifles, put those in and keep others out. If he should not "love" his mother, keep incestuous ties from forming. It is not the behaviorist's business to say what is good for society. Society must make up its mind what it wants its members to be and to do; then it's up to the

behaviorist to find the methods and technique that will bring up the child in the way it should grow.

But to carry out this aim we must have a technique for *unconditioning*—for removing emotional reactions as well as for implanting them, because we saw above that the home life, however carefully we bring up the child, almost daily stamps in emotional conditions of one kind or another. Our experimental work on the unconditioning of emotional reactions is pitifully meager. After conditioning a fear response, let us say, to the rabbit, how can we remove that fear? Talking it out (Freud to the contrary), allowing the child to become habituated to the rabbit, ridiculing the child for its fear, letting it watch other children play with the fear-producing object, forcing it to be near the rabbit—all have little effect upon uprooting the reaction. Not until we brought the gut into the experiment did we succeed.

We (Mrs. Mary Cover Jones at the Heckscher Foundation first made this test) succeeded in getting a room approximately forty feet long. At one end we seated the child at a small table. On the table we placed the child's lunch, but covered it with a napkin. At the other end of the room we placed the rabbit in a wire cage concealed from the child's view. Then suddenly lunch and rabbit were disclosed simultaneously. If the rabbit was far enough away the child began to eat. If too near she stopped. The rabbit was kept at a "point

of tolerance." The next day the rabbit was brought slightly nearer; the point of tolerance was thus advanced. At the end of a few days the rabbit was placed on the table and a day or two later in the child's arms. The fear had gone forever. There was no gut disturbance, no nausea, no vomiting, no indigestion. The gut was kept busy and orderly doing its biological duty during the whole experiment. Since these experiments were completed many similar ones have been tried out in the home. How universal this type of method will prove to be no one can tell. I have the highest hopes for it even in reconditioning adults.

The behaviorist is the first one to admit that he has built up a terrific superstructure of theory upon a foundation of very meager experimental results. His position, however, is the only one that has even meager experimental support. If his view is right, then we can expect to see in the future real attention given in the home to conditioning and unconditioning the emotional responses of the child. No longer will teaching the three R's suffice; to them we must add an E. The time must come when it will be just as bad manners in the home to be afraid, to sulk, to be over-emotional, under-emotional, seclusive, sensitive, whiney, to show affection to mother, father, or other members of the family, as to come to the table with unwashed hands, to eat with a knife or to

speak of your wife as "Mrs. Smith" (if that's your name) in front of your associates.

The behaviorist, then, has given society the rough pattern of a new weapon for controlling the individual. Will it use this weapon when perfected as a steam roller to flatten out all that is different in human personalities (which it can do in spite of "heredity" producing thereby a race of conformists)? Or will it use this method wisely?

So far, counting the millions of years society has been shaping human lives, a pretty poor job has been done. We are still awfully close to the savage. Strip off a little of the verbal veneer and polite behavior of the hands, feet, and trunk, and the raw, primitive stuff shows through.

The savage was all right for his time. Our argument is that you can't fit a savage to live in America by teaching him English and how to behave with his hands. It is essential to train his gut as well. This is one reason why human beings are so restless—they have the speech and manners of a Chesterfield and the gut behavior of an "Emperor Jones."

In the next chapter we shall see how the behaviorist deals with the problem of "Memory."

CHAPTER IV

MEMORY AS THE BEHAVIORIST SEES IT

I

MEMORY according to popular opinion is a most inaccessible psychological process—one of nature's most closely guarded secrets. It is a hidden faculty of the mind. How can the behaviorist give any objective account of memory, or even study it objectively?

Yet if the behaviorist cannot give an account of memory, behaviorism breaks down as a general system of psychology.

What are the facts about memory? All subjective psychologists, from Aristotle on, have wrestled with it, but their efforts have availed them little. Even William James, brilliant thinker that he was, defined memory in terms of consciousness, then defined consciousness in terms of memory (and other psychological processes such as sensations, perceptions, desires, etc.). If so great a thinker as James gives up the problem and argues in a circle, what strength then is there in the claim of the

subjectivists that they can give a treatment of memory which is adequate?

The real trouble, according to the behaviorist, is that the problem has been wrongly stated. It has been stated in such a way that no experimental attack can be made upon it. The behaviorists now affirm that *there is no faculty or process of memory*—there is only *learning,* and *loss* in skill which comes from lack of practice. Is this denial of the existence of memory based upon observations or is it just a way of dismissing something that troubles and vexes the behaviorist?

To justify our claim that there is no problem of memory, let us go back and study the child for a time, a favorite methodological procedure of the behaviorist. I have a boy before me one and a half years old. I give him a small kiddie car. At first he can do nothing with it, but he is muscularly well formed and he soon begins to learn to handle it. In a month he is flying along everywhere, pushing his car up hill, mounting it and then flying down hill. I then take his car away from him and let him go six weeks without riding it. Six weeks later I raise the question, "Does this child have any memory of how to ride his kiddie car?" Let us ask him. "Do you remember how to ride your kiddie car?" He says, "Ride kiddie car?" Ask him a similar question, "Do you remember how to drive an automobile?" He says, "Drive automobile?" You do not get much help here. In

other words, you can never find out by questioning him whether he remembers how to ride or not. But haven't we under the influence of our old philosophical slants wrongly envisaged our problem? What we want to know is, can he ride the kiddie car now after two months of no practice just as well as the day we took the car away from him? If not so well, then how well? The moment we phrase our problem in this way it becomes an objective one. I can answer it by experiment. I put him on the car and say, "Go!" If he dashes off the bystander says, "He does remember it, doesn't he?—Isn't memory a marvelous thing!" In everyday life we do not need to keep accurate records of learning or of the loss in efficiency through lack of practice. But the behaviorists when they turn to their laboratory must do just this. They need not have asked any questions of the infant. They would have planned their experiment scientifically. Before taking the car away from the child, they would have obtained an accurate record of the number of seconds it took the child on its last ride to pedal the car one hundred feet on a level stretch of smooth cement pavement. They would have taken also a record of the number of errors (for example, deviation of the car from a straight line) on this last trip. After the car had been returned to the child the behaviorists would have timed the child's first trip over the same course and made a record of the errors. Instead of finding performance

perfect, they find that the infant rode only 80 per cent as speedily and 70 per cent as accurately as he did on the last trip made before the car was taken from him.

If there is any mystery in all this, it is a mystery of our own making. As the behaviorist views the problem there are three things to consider: (1) A study of acquisition of skill in riding the kiddie car, (2) the disuse of the function with the attendant *loss in speed and accuracy of performance,* and (3) the process of *relearning*— that is, the length of time and the amount of effort it takes to regain the original accuracy of performance. Every stage here can be measured just as accurately as temperature or rainfall. Every step is an experimental one.

But surely this isn't the whole story. Let us take an older child. I teach my child of eight to ride an ordinary bicycle. At the end of two months he can ride up hill and down hill anywhere in the village. I take his bicycle away. At the end of two months I say to him: "James, do you remember how to ride your bicycle?" He says, "Of course I do, father. I can ride it just as well as the day you took it away from me." Now the layman and, alas, the introspective psychologist say, "I told you so. There is a process of memory. The eight-year-old child has developed it more highly than the one-and-a-half-year old. How are you behaviorists going to account for this?" But let us see. The behaviorist in his careful way had

timed the eight-year-old's last quarter-of-a-mile ride before the bicycle was taken away and had made a record of the errors on that trip. At the end of two months he gives the lad his wheel again. He times his first quarter-mile trip and records the errors. Again he finds that there has been an appreciable loss in both speed and accuracy. The child's verbal report was thus no index of the loss through disuse.

What is the chief difference between the one-and-a-half-year-old and the eight-year-old—a difference in some memory faculty? Not at all. The eight-year-old when he learned how to ride the bicycle—that is, learned how to use his hands and legs and trunk—*learned also how to talk about it*—that is, he learned to ride both manually and verbally. At any age past the three-year-old stage we put on verbal habits almost universally when and as we put on our manual habits. But we put on very few verbal habits before the three-year-old period. This is the reason we never "remember" anything earlier than the third year of our life. We cannot verbalize our early habits—verbal conditioning has not proceeded far enough. For this reason we should look with some reserve upon the claims of psychoanalysts who assert that by analysis they can revive infant memories of events taking place too early for verbalization to have occurred (see Chapter VI). The only way we can test whether an infant, too young to verbalize, has any memory is to put

him back in the old situation and see if he performs the old trick.

II

What the introspective psychologists usually mean by memory is that the verbal part of most of our habits is always on tap. Consider our sports. We all play golf; put on the necessary arm, leg, and hand adjustments to drive the ball around the course. But as we are putting on this arm, leg, and hand adjustment we are putting on verbal adjustments as well. A stranger comes up and asks us on a snowy day in winter, "Can you play golf?" We immediately enter into an animated but one-sided conversation. We talk drives, brassies, and lies, niblick shots, putts, water hazards, bogie, and par. As a matter of fact, most of us play verbally in the winter time a much better game of golf than we can play with our clubs out on the links in summer time. The only way to check whether our actual game squares with our conversation is to take us to the links. Socially, it is not polite to do this. In real life we all accept the unwinding of the verbal habit at its face (manual) value. But where there is no verbal habit established there is no way of testing "memory" without putting even the adult in the old situation where the habit was formed. Suppose I teach a deaf-mute who can neither read nor write to play

golf well. Suppose you ask him whether he can play golf. The deaf-mute, of course, cannot tell you about his game. He has no verbal habits. The only way he can demonstrate that he can play golf is to go to the links, take his club, and begin to play.

One may argue that such cases are not typical. Let us look for a moment at an everyday occurrence. In crossing Fifth Avenue one day you suddenly meet a man. Without hesitation you hasten toward him and say, "Hello, Bill, I haven't seen you for twenty-four years—not since we used to play football at the University of Chicago. Do you remember the Thanksgiving game we won from Michigan on a touchback?"

Isn't this a marvelous feat of memory—something different from the case we have just examined? The answer is, not at all. Years ago you learned about Bill Jones just as you learned about everything else. You established habits of reacting to him and habits of speech with him. You put on these verbal habits with and about him at the same time you put on your football habits. At the end of twenty-four years your football career is over—but your verbal organization about football still remains—not perfect, but intact enough to come to the surface the moment Bill's face appears. The chances are good that your verbal organization for this period of your life has been impaired, too, more than you may be inclined to admit, for on the very next corner you may

meet George, who also belongs to your football days. You may even rush up to him and start to shake hands. You may then begin to stammer, and hem and haw. His name won't come. You fall back upon the old alibi, "Your face is familiar—I never forget a face—but I can't quite get back your name." As long as you were in the University with him daily your verbal reactions to him were perfect. After twenty-four years of disuse, the speed and accuracy of your verbal responses have decreased. The fact that the sight of Bill called out his name from you and that George's face did not call out his name would lead the Freudians to say that there were certain elements in your old association with George which brought about "suppression." We will not argue now how much there is of truth in this view. The behaviorists do wish to go on record, however, that their experiments prove that the mere *disuse of a function*—any function—will normally bring about a loss in the speed and accuracy of that function. Their experiments in comparative psychology convince them that even animals (as low in the scale as the rat) show that disuse of a function brings the same kind of loss in speed and accuracy of performance in their reactions as it does in that of man—and there can be no real question of suppression in the animal world.

The so-called memory loss (I speak here of normal cases) comes apparently from the gradual breaking up

of certain motor systems (integrations) which were built up during the *learning process*. Even the pyramids disintegrate with time. Try to think of a tennis player who gradually through practice has built up marvelous skill in tennis playing. He does nothing but play tennis. His whole body gets organized for it. Think of the intricacy of the muscular systems of his right arm developed just for this form of action. Now suppose at twenty-eight years of age he has to earn his living by plying the trade of a blacksmith. The pounding of the iron on the anvil with the heavy sledge hammer calls for the use of other combinations, to be sure, of those same muscles used in playing tennis. Blacksmithing thickens the muscles and sets and stiffens them. It hardens the tendons. They lose their flexibility and suppleness. Age helps in the hardening process. Is it any wonder that two years of blacksmithing totally unfit him for playing the delicate game of tennis? His whole body organization has become different.

Often champions in skillful acts seem to go to pieces quickly in spite of practice. This is especially true in this country where champions are pampered and petted. Usually late hours, dissipation, over-eating, are the factors which even practice cannot successfully combat. Several of the British golf players have almost defied the stiffening hand of time.

Nor is the situation where the original learning was

almost wholly verbal any different. The silver-tongued university professor whose range of information was almost limitless can easily lose his organization through disuse. Suppose, for example, that, due to one exigency or another, the lecturer has to become a traveling salesman or an insurance man for three years. He tries to lecture on his subject once more. He lectures with effort. He is a failure. Either he must read more of the work of others and continue with fresh experiments of his own, or give up lecturing in the field in which he was once an authority. The (neuro) muscular systems of our body are limited; unless we can keep them exercised in our specialties they must break down and the individual muscles be gathered into new systems.

Of course, this process of disintegration of muscular systems is a godsend too. It saves us from carrying around for long a host of useless verbal and motor organizations. If we had to remain organized to do everything we ever learned from infancy to adulthood, each one's life would be a burden both to himself and to his friends. But at four years of age we put away many of our three-year-old habits; at eight, many of the habits which we put on at seven. Unfortunately, we all carry along too many of these infantile and childish organizations until the adult stage is reached. This is especially true of our infantile emotional organization. We weep when our feelings are hurt just the way we wept when

our mothers scolded us. We sulk or weep when someone fails to greet us cordially and say "nice fellow," just as we sulked or wept when our fathers failed to say "nice boy" when we performed for him. The mass of organization we are allowed to carry over from our home life is one of the most tragic things in our makeup.

This is the behaviorists' view of memory.

III

But those who were trained under the old system where memory was made a kind of god from the machine may find this view very incomplete. You may think of it as having to do only with so-called motor memories and verbal memories. You miss the talk here of "visual memories," "auditory memories," and the like, so prominently discussed in psychology and educational circles years ago before behaviorism came on the scene to disturb the fundamentalists. You question the behaviorist, "Is not my 'mind' often flooded with 'mental pictures' (visual images) of scenes from my past life? Can I not close my eyes and picture to myself almost with photographic accuracy persons, places, things that I have met with in my past? And cannot I go into a quiet room and have my mind filled again with the melody that I heard at the concert last night (auditory images)?"

This certainly was the older view of psychologists—it

is believed in by hundreds of psychological professors in our universities to-day. For them there is not only perception of things when objects are present to the senses but also a world of mental images of these same things which come into the mind when the objects are no longer there to stimulate our sense organs. We get these images, according to them, when one brain system excites another brain system (*centrally* excited "sensations" or "images"). In other words, they believe that when the sense organ and brain are active together we have the perception of things, but when the sense organs are out of commission (no object present to excite them) then the brain itself can become independently active. Then we have in consciousness only *memory images* which may be auditory, visual, or kinæsthetic in type. All this is orthodoxy.

But the behaviorist, having made a clean sweep of all the rubbish called consciousness, comes back at you: "Prove to me," he says, "that you have auditory images, visual images, or any other kinds of disembodied processes. So far I have only your unverified and unsupported word that you have them." Science must have objective evidence to base its theories upon. The behaviorist, on the contrary, founds his systems upon the belief supported at every point by known facts of physiology that *the brain is stimulated always and only from the outside by a sense organ process.* The nervous

system works only in arcs—first the sense organ is stimulated by an *object* from the *outside* or through the *movement* of our muscles and glands on the *inside*. The impulse travels to the brain and from the brain to the muscles or glands. Always when there is activity on the part of the organism one or several of these complete arcs are functioning. In other words, there is always an object stimulating us—if not a chair or table, then some organic or muscular process such as the muscular process in the throat that we use in whispering to ourselves (thought).

What then becomes of images? Why, they remain unproven—mythological, the figment of the psychologist's terminology. If our everyday vocabulary and the whole of literature had not become so enmeshed in this terminology we should hear nothing of imagery. What have we in their place? What does a person mean when he closes his eyes or ears (figuratively speaking) and says, "I see the house where I was born, the trundle bed in my mother's room where I used to sleep—I can even see my mother as she comes to tuck me in and I can even hear her voice as she softly says good-night"? Touching, of course, but sheer bunk. We are merely dramatizing. The behaviorist finds no proof of imagery at all in this. *We have put all these things in words long, long ago* and we constantly rehearse those scenes verbally whenever the occasion arises. An educated deaf-mute

can tell just as dramatic a story. Miss Helen Keller, when she writes, pictures the colors of the autumn sunset just as beautifully as if she had viewed sunsets every day of her life. She can describe, when she writes, the beauties of the autumn woods far more dramatically than I can. The whole point is that when we are in the presence of landscapes we verbalize—when we are at concerts we verbalize. The next day we may start out and say to ourselves or someone else, "Didn't Kreisler play that passage from the Bach Chaconne marvelously!" And the first thing you know we are actually humming it either aloud or at least muscularly phrasing it subvocally. We do not need visual images—we do not need auditory images, we do not need any kind of images to account for any part of our so-called inward "mental" life. Verbalization which can go on aloud, at a whispered level or at a still lower level (that of thought), takes the place of all so-called memory images. What we mean by being conscious of events which happened in our past is that we can carry on a conversation about them either to ourselves (thought) or with some one else (talk).

We are back again where we started—all "memories" are at bottom motor memories and obey the laws of learning, disuse, and relearning.

What about the problem of thinking?

CHAPTER V

HOW WE THINK: A BEHAVIORIST'S VIEW

I

ONE of the questions most frequently asked of the behaviorist is, "How can you make a place for thinking in your theories—how can it ever be observed objectively?"

To the antagonists of behaviorism this question is supposed to be unanswerable. Even those approaching behaviorism in a kindly way are here not very sure of their ground.

Considering the kind of philosophic juice we have all been steeped in, it *is* hard at first to follow the behaviorist. It is quite easy to understand how he can observe objectively all overt activity—such as playing golf, tennis, swimming, chopping wood, bricklaying, and the like; and to believe that very valuable results have come from work of this kind. Even so critical a student as Bertrand Russell admits that this part of the behaviorists' theory is sound. But when it comes to thinking, the behaviorists' case seems much harder to establish. The difficulty is

that when thinking goes on the body seems inactive—seems not to be behaving. Thinking and related processes therefore must be done by the brain (or the mind) and not with the whole body. They must be *"mental."* The distinction between purely "mental" activity and physical activity seems to be very real to the layman.

But the behaviorist admits no such distinction. He holds that entirely too much mystery has grown up around "thinking." Since the time of the philosopher Descartes, "thought" has been put upon a pedestal. We should worship at the feet of this image but we should not try to understand its essence. *Cogito ergo sum* was Descartes' expression of obeisance. But the faulty logic in the mystical phrase "I think therefore I am" is all too obvious. It was designed just to convince the church fathers that he could provide a place for the soul in his philosophy.

Religious philosophical dogmas of this kind have long deterred us from making even a decent logical formulation of the way thinking goes on. Throughout the ages churchmen—all medicine men in fact—have kept the public under control by making them believe that whatever goes on in the world which can't be easily observed must be mysterious, must be strong medicine, something much more powerful than those things which can be observed. The motive is obvious. It is the only way the medicine man can keep control. Science has al-

most had to blast its way through this wall of religious protection. It has blasted successfully in the field of physical phenomena; now it is blasting in the field of biology—sometimes, as in the South, in solid rock. One can almost believe that even scientific blasting will be hopeless in clearing away misconceptions in the field of psychology—and this is especially true in the realm of thinking.

The behaviorist offers a very simple, clear, straightforward, scientific theory of thought. It is so straightforward, so matter of fact, that even the introspective psychologists, who are lovers of mystery, find difficulty in understanding it—not to speak of accepting it.

The behaviorist's theory of thought hinges upon the way word habits are formed—upon word *conditioning*. Let us take the earliest word habit so far experimentally recorded—one formed at six months of age in infant B. In his babblings I often heard the sound *da*. I decided to try even at this early age to make this word *substitutible* for an object—the milk bottle. I would wait around him with the bottle behind my back until he happened to babble *da,* then I put the bottle into his mouth. This was repeated again and again. Soon he would say *da* every time I showed him the bottle. When conditioning was complete, the word *da* came to call out the *same reactions* as the sight of the bottle. If I had been silent always and his only attendant, I could have built up

in this way a wholly new language in him, totally different from my own or any other known language. Instead of feeding him I could have built the word in, or conditioned it, by punishment. One of his earliest words established in this way was "hot." Crawling near a hot radiator he touched it, drew back his hand, crawled away from it, cried. Just as he touched it, I spoke aloud the word "hot." After two such accidental happenings just the word *hot* made him draw back and put his hands behind him. As soon as he went near the radiator he would cry out "hot" and draw back.

By this simple process of conditioning—showing the object and speaking aloud the word, we built up a vocabulary. As he learned to manipulate objects—orange, apple, bottle, man, dog—he learned the conventional words which he could also manipulate (say aloud, repeat again and again). Now these words soon came to call out the same reactions in the child as would the objects upon which the words are conditioned. Some of our objects arouse violent reactions. The words conditioned by these objects also arouse strong reactions—"Look out, there is a *snake* behind you"; "there is a *spider* crawling up your sleeve." Words conditioned by action-arousing situations—are also potent in arousing action—"stand up," "sit down," "attention," etc. Words are thus equivalent to objects in releasing behavior. The words are thus substitutes for objects. Words once formed, the

human ever thereafter has two worlds—a world of objects, and a world of words which is substitutible for the world of objects. Man is the only animal who has these two worlds. He is the only animal who takes his environment to bed with him in the form of word substitutes. He keeps it with him in darkness—he keeps it even if he loses his eyesight. He can manipulate this word world just as he manipulates his object world. It requires no space to house this word world. It has its drawbacks too. Psychoanalysts and nerve specialists often send their patients away to change their environment; but alas, the patient carries his substitute word world along with him. It has within it all the old conflicts of his object world.

II

Now follow the behaviorist one step further. Man reacts not only to words spoken by others and to words read in books, *but also to words he himself silently speaks.* Why does he speak words to himself? Because he has been conditioned to speak words aloud and to himself when in the presence of objects and situations upon which the words were conditioned. Man—because he is gregarious, because he finds it easier to carry around words than to drag around Dean Swift's bag of objects—learns to make most of his reactions in a verbal way.

This paves the way to thinking. The simplest form of thinking can be seen in the three-year-old child. Suppose we peep through the keyhole at a three-year-old and listen as we watch. He may have two hundred words in his repertoire. He has been conditioned upon sentences as well as upon words. He opens his eyes. There is no one in the room. He calls mamma, nurse, dada, doll, etc. He runs over his repertoire of words and sentences. "Billy wants breakfast," "Billy going bye-bye." As he grows older the outspoken verbal responses become more complex. Parents are eager to have him talk. *He talks aloud incessantly even when no one is around.* As the family becomes assured that he is not an idiot, not dumb, they get a bit weary of so much babbling. They cry out, "Keep quiet" (reinforcing it sometimes with a tiny spank). Thereafter the child mumbles to himself. We still hear him—he disturbs our smooth-running life. Again we say, "For heaven's sake stop mumbling to yourself." Mumbling gives place to lip and mouth responses —silent mumbling. We can't hear this but we see it. We socialize him still farther—"Can't you stop moving your lips when you read and think?" Complete socialization next occurs. *The child goes on speaking but now he really talks to himself. There is inward verbalization.* The only freedom he has left lies in the silent realm of his own unspoken (but muscularly formed) words. What

goes on behind the closed door of his lips is none of society's concern.

Thought then is a form of general bodily activity just as simple (or just as complex) as tennis playing. The only difference is that we use the muscles of our throat, larynx, and chest instead of the muscles of our arms, legs, and trunk. If we could actually see the play of the muscles of the chest, throat, and larynx when we think, no mystery would ever have grown up. There is no mystery in tennis playing. We see the movements taking place; we can actually photograph them with the motion-picture camera. If we photograph them in front of a series of lines of known dimension, and show a time-measuring device on the film, we can then measure the extent of every movement and time it. If we could similarly measure and time the throat and chest musculature, see the end result—the word—show up in some way, the way we see the tennis ball knocked back and forth, we should feel that thinking is just as commonplace as any other motor activity.

Do we use only chest, larynx, and throat muscles when we think? Do we play tennis only with our right arm? Certainly not, we do everything with our whole body. But if I suddenly cut a muscle in your right forearm then tennis playing is sadly disturbed. The right forearm segment of the body is the dominant or controlling one in tennis playing. Just so are the muscles of the larnyx,

throat, and chest dominant in thinking. Any interference there—even a bad sore throat—slows up the thinking process. We think with our whole body; the shrug of the shoulder, the catching of the breath—even the (conditioned) nausea in our stomach which occurs when we are with people who disturb us—are all a part of the organized behavior executed with inside muscles. A nod of the head for "yes," a shake to right and left for "no," a raising of the eyebrows and head and shoulders for "I doubt it," are also part and parcel of the complex process of thinking. It might be better to give up the term thinking and use the term *implicit behavior* in its place. We should mean by that all of the organized (but still *objective*) behavior that goes on in the muscles and glands inside of us. But since the human solves most of his problems with words, so most of our implicit behavior is verbal.

If our main contention is reasonable, objective, and logically tight, how foolish are most of our trite remarks about thinking. "Cultivate the thinking process." "Learn to concentrate." "College is a place where men learn to think." *The truth is we learn to think by learning to do.* We can think no straighter, no better, no broader than the world we have lived in. We learn to think better as we learn to do better—as we meet with new objects, new situations, new people—get into difficulties and out of them. As we become more and more

skillful with hammer, saw, and chisel, we become better thinkers as carpenters if we verbalize each step as we learn it. Of course, the yokel is not so taught in his infancy to verbalize his acts. He remains a hand actor—a hewer of wood and a drawer of water. As we become more skillful in fighting fires, we become better thinkers on fire prevention. Those of us who live among cultured people have to learn to verbalize everything we do with our hands. At our mother's knee we learn to talk about what we have done during the day. This constant mutual support between verbalization and doing explains why nothing ever comes from philosophy—because it has become lost in words which are not correlated with and substitutible for overt action. The new things in the universe come from the doers—the chemist, the physicist, the engineer, the biologist, the business man. With them doing leads to thinking, and thinking in turn leads to doing. With the poet, the philosopher, the day dreamer, thinking leads not to doing but *merely to other words* either spoken or thought; the endless chain of words is never broken.

III

And what is the evidence for the behaviorists' theory of thought?

Its strongest claim is that no other theory of thought

so far advanced can lay the least claim to being scientific. It brings thought into line with all other forms of human activity and behavior. It brings thought into line with all other acts of skill. It is a theory which agrees with all of our known biological, physical, and physiological facts.

Its strongest supporting evidence comes from the study of the child. At first, as we have already seen, talking and thinking in the child are identical. As the child becomes socialized he continues to talk aloud when adjusting verbally to people but to talk to himself (subvocally) when alone. We see in adults around us all of the transitions: Badly bred people think aloud even when alone; people slightly less well bred mumble aloud when alone. There is another group who move only their lips when they think. A good lip reader can often read what they are thinking about (what they are saying to themselves).

What evidence we have from the study of deaf-mutes confirms it. Until they are taught a word world in one form or another, for example, through the use of the sign manual, they are supposed to be quite "stupid." As soon as they become adept in the use of words "intelligence" seems to increase by leaps and bounds. Now such people *think* by using the word signs; they use them even when alone. I have gathered considerable evidence upon this. A normal individual adept in the use of the manual, when thrown constantly among deaf-mutes who are thinking,

can often read their thoughts by watching their finger and hand movements. This is similar to what can be done in reading the lip movements of the incompletely socialized normal individual. Again, as the deaf-mute becomes highly socialized, his finger, hand, and arm movements become smaller and smaller in extent until they sink below the level where they can be observed objectively without the use of instruments. For example, with Laura Bridgman it was impossible when she was tense and with people to read her thoughts from her finger movements, yet when asleep and relaxed *her dreams could be at least partly read by her finger movements.*

Considerable evidence comes from asking people to *think out a problem aloud.* Before doing this, however, watch how they learn to get out of a complicated maze they have never seen before. They stumble about, trying all blind alleys, retracing their steps to the starting point —going back to ground already worked over, falling into errors at every point. Finally they stumble on the right pathway. Now put them into a verbal maze and ask them to think it out. Show them a new object never seen before and ask them to *think out loud* at every step and tell what the object before them is used for. They start in like a rat in the maze. "It is made of metal—it weighs about two pounds—it can't be used for that because of so and so." If the person is really unfamiliar

with *all* such objects (has little verbal organization about them) his thinking is pitiful. You lose all respect for thinking as a highly "intellectual" process. You find that your subject will almost at once try to manipulate the object with his hands. If you let him have the box he tinkers with it, talks about it, handles it again. He uses his whole body in solving the problem. His behavior is quite like that of the poor hungry animal who has to open a new trick box before he can get his bit of food. Under such conditions the human becomes really human. You begin to place him where he belongs—on a scale—at the top, to be sure, with other animals, both with respect to his doing and to his thinking. The reason we get such exalted ideas of the occasional human is that we tackle him upon his own thinking ground—ground which he has so thoroughly mastered that you could not ask him anything which would involve any *new act of thinking*. He snaps out his answers as quickly as you could the answer to the question—what is the cube root of 1000 multiplied by 10 divided by 2?

The use of instruments shows that during thinking some kind of muscular activity goes on in the throat and chest region. It is true that we cannot get these muscular responses registered upon wax cylinders and then later play them upon a phonograph and have the words of our thoughts spoken out loud. But we may yet get

these inward muscular responses registered in some equally objective way.

We do not need to wait in psychology until we can objectively record words we use in thinking. Any effective thinking will and must eventuate in action—either in hand, lip, arm, and trunk action, as when the inventor makes the first wooden model of his thought child, or in written words, when the poet writes out the poem he has already whispered to himself. Or in some overt verbal statement such as "I have thought this thing all out. I think you ought to take the chance and do so and so."

After all, there is astonishingly little real thinking done—real thinking where, by the manipulation of our word world, new verbal conclusions are reached which in turn can serve as stimuli for making us change and modify our object world with our hands. Most of our word organization is as inflexible as the grooves on the phonograph record. We turn the records on when we are alone and play them over and over again. There is no improvement in our thinking. This corresponds with what goes on in our overt actions. Few of us after a certain age improve our golf, our tennis, our skill in our vocation. We get lazy as soon as we can get along socially and financially in the group in which we permanently find ourselves. It is only when we get up against it —get into some jam—that the environment stimulates us

sufficiently to make us start real learning with our hands and real thinking.

This view of thinking should have some bearing upon our training of youth—should we not seek to make them *do* from morning till night, from earliest infancy to old age, and should we not seek to have them *consolidate their daily doings adequately in words?* The youngster ought to do the multiplication table before he puts it in words. He ought to do his algebra, his geometry, and his physics first and then immediately formulate his problems and solutions in words. We ought to have work shops of every description rather than text books. Each student should write his own text book from his workshop activity—as a verbal formulation of what he is doing. Thinking should then be the equivalent of doing at every moment.

The goal of training thinkers is to give them such mastery over their word world that they can manipulate it and bring out *new* verbal formulations in the form of judgments or "conclusions" which can later start their hands to work in shaping some new *object* in stone, iron, brass, oil, or clay.

This theory does not mean that everyone who expects to be a thinker must first be a blacksmith or carpenter or a manual worker. If he is to do things with his pen he must travel, read books, go to theaters—in a word, live among the situations he is later to portray *and he*

must organize and consolidate in words his daily life as he goes along, or else when he comes to *do,* to *write* or *paint,* he finds his thoughts poverty stricken.

In the next chapter we shall take up the problem of behaving without thinking—the so-called field of the "unconscious."

CHAPTER VI

THE MYTH OF THE UNCONSCIOUS

WHY is the "unconscious" so popular to-day with psychoanalysts and certain psychiatrists? They have written so much about it that even the layman, if he lost his unconscious, would feel as badly about it as did Peter Schlemihl when his faithful shadow departed in the keeping of the devil.

The physicians popularized the "unconscious" because they needed something to help them explain so-called "mental" diseases. If we had asked a psychiatrist in the 'eighties to tell us about "mental" diseases he would have pictured them as being the result of degenerative changes taking place in the brain. Whether the changes were due to an infection of some kind, to the growth of invading tissue, to faulty metabolism, to chemical deposits in arteries and veins, or to some destructive chemical process possibly secreted by the body itself ("auto-intoxication"), he might not have cared to venture an opinion. Dementia præcox and paranoia were diseases similar in some ways to typhoid fever and malaria. One of the difficulties in the way of holding this view was the

stubborn fact that pathologists were unable, when the patient was examined after death, to find where and how the brain was diseased. Nothing seemed to be wrong with the body or with the brain. At first Breuer, and then more completely Freud, *introduced the idea of a diseased mind in a healthy body.* Freud had been trained on the then current mysticism of mind—of mind as a thing or entity distinct from the body. He had been trained, too, as a physician, and that meant he had to think in terms of *disease entities.* Since there was nothing wrong with the brain in these "mentally" sick individuals, then there must be something wrong with the mind. There must be a true *pathology of mind.* There must be *some festering spot,* some deteriorating agent present eating into the tissue of the mind. Since the physician could not locate the festering spot in the so-called "conscious mind" of the patient, he invented a substratum to mind in which he could safely place all "mental" troubles. This substratum he called the *unconscious.*

Just why Freud should have resorted to voodooism instead of falling back upon his early scientific training is not clear. He was particularly well versed in the Old Testament and widely read in folk-lore. One cannot help but accuse him of having been much influenced in his youth by the fable of the devils who took flight into Gadarene swine at the command of the great master therapeutist with a few mystic words. With the religious and

medical background he had, possibly it is not so strange, after all, that he gave us the kind of unconscious he did. Just as a sharp object when swallowed into the stomach gets lodged, goes on creating organic disturbance until cut out (or thoroughly incrusted over), just so at times "sharp perceptions" or "ideas" (those we can't "bear to entertain") sink through the œsophagus into the stomach of the mind—the unconscious. There the foreign body stirs up trouble until removed by the scissors and scalpel of the analyst (psychoanalysis). If the body can be infected, so can the mind.

Since the advent of behaviorism in 1912, with its emphasis on the genesis and growth of behavior, analysts have sought to claim that Freud was a *geneticist*. Nothing is further from the truth. Freud's early writings do not mention the word *habit formation* or *conditioning,* and yet he was exposed to the work of the Russians and of the animal psychologists throughout the time he was maturing his own theories. *His theory of the unconscious was and is a theory paralleling completely the old concept of disease entity.*

The scientific level of Freud's concept of the unconscious is exactly on a par with the miracles of Jesus. The scientist can say this despite his reverence for Freud and his admiration of Freud's courage in insisting upon the rôle sex plays in the lives of all. He can say this in spite

of the fact that Freud's teachings have stimulated the thoughts of all psychologists and of all psychiatrists.

Behaviorism when it appeared could find no mind-body problem—not because, ostrich-like, its devotees hid their heads in the sand, but because they would take no account of phenomena which they could not actually observe. The behaviorist finds no mind in his laboratory, sees it nowhere in his subjects. Would he not be unscientific if he lingered by the wayside and idly speculated upon it? Just as unscientific as the biologists if they were to linger over the contemplation of entelechies, engrams, and the like. Their world and the world of the behaviorist are filled with facts, with data which can be accumulated and verified by observation—with phenomena which can be predicted and controlled.

If the behaviorists are right in their contention that there is no observable mind-body problem and no observable separate entity called mind, then there can be no such thing as consciousness or its substratum, the unconscious. Freud's concept, borrowed from mysticism and somatic pathology, breaks down. There can be no festering spot in the substratum of the mind—in the unconscious—because there is so far no evidence that mind exists.

If there is no mental infection—no unconscious to be infected—what can the behaviorist find in natural science

to account for the objective behavior facts observed by Freud?

In the place of the Freudian vitalistic unconscious the behavioristic substitutes the *unverbalized.* He has a contrasting term, too—the *verbalized.* This substitution of the unverbalized for the unconscious is not just another wild speculation. Let us prove this by examining human behavior.

The child at twelve months of age is given a new world—a world of words. He masters this world slowly. Every object he plays with is named. Even objects heard and seen, but not touched, are named—the sun, the moon, the stars. The process by which we build in words is called "verbal conditioning." Each word comes finally to call out the same response that the appropriate object itself would call out. It matters not at all what the object is called. A group of children could form a wholly new and fantastic language just as quickly and just as easily as they can learn the language of their parents. We must dislodge the age-old belief that there is some peculiar essence in words as such. A word is just an explosive clutter of sound made by expelling the breath over the tongue, teeth, and lips whenever we get around objects. We condition our children to make the same explosive sounds when they get around the same objects.

The natural course of events from the second year onward is to learn the object and the spoken word together,

then the object and the printed word, and next the object and the written word. Words in any of these forms become substitutible each for the other and for the object around which the conditioning was originally built.

But does this process continue until the word world shows a point-for-point correspondence with the object world? Not at all—and why? Because our teachers—that is, our parents, nurses, and adult companions—haven't themselves a word world as large as their object world. Just as they are limited in this respect, just so do they limit the children. And why are the parents limited? Because in the status in which they live there has been no necessity, from the standpoint of obtaining food, shelter, and sex, for building in a larger number of words than they have. Dr. Rivers showed years ago that many of the primitive tribes have no words for certain parts of the spectrum which we constantly name. Again, the Chinese musical scale leaves out certain notes we include in ours. Their notes and intervals, consequently, are different. Yet a stretched string vibrates in China just as it does in the West.

Why not call that part of the individual's object world which he constantly manipulates with his hands, feet, and body, but does not name or attach a word to—his world of situations and his own responses to them which he does not name—his "unconscious" world or, in the behaviorist's terminology, his unverbalized world?

Consider for a moment what people mean or at least should mean when they say they are *conscious* or have *consciousness?* They mean, in the words of the behaviorist, that they can carry on some kind of brief subvocal talk with "themselves" behind the closed doors of the lips. We get into the habit of using "ourselves" as an audience very early in life. It begins immediately after words, phrases, and sentences are first learned and continues for a considerable period thereafter. All children, according to our observation, think aloud at first. Thinking aloud disturbs society. The child who does it is considered unsocial and in need of subduing. The subduing process ends in sub-vocalization. This robs us of our audience, and to compensate for that we build up a *verbal fiction—a straw man—and put him up in front of "us" to talk to*—which is what the child does when he talks to his doll. The fiction of "ourselves" is equivalent to our doll playmate—and still many of the introspective psychologists go on writing books about the "self"! If this does represent the thing psychologists call consciousness, it is clear that it is always a *completely verbalized affair.*

We must then draw the inference that while a large part of our world is *verbalized,* a still larger part remains possibly forever *unverbalized.* What are the unverbalized components of human behavior? We have (1) the unverbalized world of the man who was trained

to be a *silent* man. The child brought up in isolation, or around taciturn parents or in groups where verbalization is frowned upon, never even as an adult learns to verbalize his world or his acts. He cannot tell you in words what he can do. He can only act when brought face to face with objects in their appropriate settings. This is typical of the behavior of animals. It is typical of the behavior of many primitive peoples; of men like Jack Dempsey, Calvin Coolidge, of a great many athletes and acrobats. They could not tell you, if their lives depended upon it, how they do certain things—their word world just does not correspond to their object world.

Next there is (2) the unverbalized world of each of us made up of the activity of the unstriped muscular and glandular parts of our body (intestines, lungs, blood vessels, the viscera generally) and of the stimuli which call forth the activity in these parts. The happenings and goings-on in our body and the mechanical, chemical, and glandular stimuli which call forth these happenings, are probably as great a world as that made up of objects (named, of course) which call out visual, auditory, olfactory, and gustatory responses in us. Yet this whole world remains unverbalized even in the adult. We do not know how to start to name these acts or the stimuli which call them forth. Words for them have not been built up. Society makes no demand upon us to name them. Kempf's discussion (Psycho-pathology) of the

autonomic "strivings" (without his needless references to consciousness) possibly best illustrates this world. This whole world we may call the unverbalized world of the emotions.

Then we have (3) the world of infancy which is totally unverbalized for the first year and practically unverbalized until the end of the second year. This is the period where many thousands of reactions are built in, both manual and emotional. The general patterns of reactions to mother, father, sister, brother, nurses, to the child's own body and to other people, are built in. It is the period when temper tantrums, fears, rages, dependencies, are all established. This two-year period is probably both somatically and behavioristically the most important part of the child's life.

If all of this sounds reasonable—and it does to many —can't we say that the *unverbalized* of the behaviorist is a natural science substitute for the *unconscious* of the psychoanalyst? If so, the mystery of the unconscious would straightway disappear. Many of our acts—possibly most of our acts—and the stimuli which call them forth, have no verbal correlates because the social environment of the individual has offered no possibilities for conditioning word responses—or at best faulty and inexact methods. To understand the lack of verbalization we must study how the individual is built up from the *squirmings* we see in the child at birth.

This can be made clearer by examining how the infant builds up its nest habits. In the two-year-old only child brought up by an unscientific mother we find that the child cries unless held in the lap of the mother, will not eat unless fed by the mother, will not play with its toys unless in the room with the mother, cries and goes into tantrums when the mother leaves the room or goes out on the street. It will not be bathed except by the mother. It will sleep only when in bed with the mother. It will cease crying when slightly injured only when the mother binds up its wound and kisses and fondles it. Up to two years of age there has been no verbalization beyond a few dozen nouns and pronouns. Verbalization begins, it clusters around the mother just as the child's manual and bodily activity clusters around the mother. In a similar way the gut reactions (emotions) have their center of reference in the mother—manual, verbal, and emotional tied together by this one, all-exciting stimulus (she is really a complex situation at all times). Here we have a rough picture of the genesis of a mother fixation. We will suppose this unwise mother continues to rear her child. She gives her little organization about sex—the mother has heard nothing of mental hygiene. The unwise training is continued. It hardens, becomes set. Under social pressure the girl gets married to an unwise man. After the honeymoon she begins to use every device to be constantly under her mother's roof and in her

mother's presence. Married life means nothing; the girl cannot break her nest habits. The mother dies, the husband leaves her, and she goes into the hands of the analyst. The assumption here is that this whole realm of her relationship to her mother has remained *unverbalized.* The genesis of her behavior is clear to the behaviorist. It has been a genetic process built in by her environment; no mystery need be made of it; no hypothesis of the unconscious need be assumed; no hypothetical factor such as suppression or repression need be lugged in. Talking to her in terms of the "unconscious," of "repressions," "limitation of libido," of "incest complex" and the like, leaves her cold. She has no words to correspond with her behavior toward her mother except the conventional ones tolerated and extolled by society under the guise of the beauty of mother love. She did not and could not ever have conversed with herself about all this. Hence she was never "conscious" of her behavior as being incestuous. Hence her conscience never hurt her (unless some analyst disturbed her by telling her about it). Hence there was no transition of a thought (too bitter to entertain) over into the cesspool of the unconscious.

The behaviorist would say that in such cases straight unconditioning was indicated, then retraining. He would say further that the process of retraining must be comparable to some extent at least to the time it took to wind

the patient up in this way. When the analyst begins to talk of such cases in terms of psychoanalysis, when he puts the patient on a couch day in and day out and lets her wander over millions of miles of verbal territory, possibly barren for years, in an effort to reach her unconscious and to straighten it out, I am strongly reminded of the words Hecate said to the witches:

> "O, well done! I commend your pains;
> And every one shall share i' the gains:
> And now about the cauldron sing,
> Like elves and fairies in a ring,
> Enchanting all that you put in."

In contrast, the behaviorist's unverbalized is throughout a natural-science concept. It has a common-sense origin and growth. We know that fears in man and animal are built in in the simplest kind of way, most of them —long before verbalization begins. Starting with loud, sharp sounds and loss of support as the unconditional stimuli, we build in fear of furry animals—fur—cotton—wool—hair of the human body; of water; of moving trains, high places, bridges, trestle-work, inclosed and open spaces, and the like (many of these by hypothesis!). Along with the actually conditioned responses we have the transferred fears, about which there need be no mystery, since such "transferences" are always obtained in every experiment where the animal is being taught to respond differentially. Again—and here at first sight

the process seems more obscure—we have conditioned fear responses of the first, second and succeeding orders. Conditions become so complex that the original genetic source of these types of responses—from the two unconditioned stimuli—can with difficulty be traced.

From equally simple beginnings love and rage responses grow, and long before words are put on.

Finally, we have the still more complicated types of response where successively the individual has been conditioned to respond emotionally in more than one way to the same stimulus or situation—*e.g.,* where the daughter responds to the contact stroking and kissing of the mother, to her loud noisy behavior when drunk or quarreling, and to her as a hampering, restraining stimulus. Love, fear, hate responses to the one stimulus. Surely we do not need here the "bivalence" and "multivalence" theory of the analysts or any unconscious to understand the reactions of the individual who does not respond to group-behavior patterns.

Not one of our hypothetical subjects in whom such unverbalized organization has taken place can "talk it out" until the analyst talks it in. There is nothing to talk out—no unconscious to be reached. Our belief is that the analyst should talk it out only long enough to get the main features of the patient's biography, part of which he can get from associates. Nor is he, by talking it out or analyzing dreams, approaching any traumatic injury or

festering spot in the unconscious. He is or should be watching and noting verbal behavior objectively. His attitude should not be different from what it would be if he were watching and recording the patient's movements as she goes about the room, her eating habits and sex habits. *When observation is complete enough the physician can make a diagnosis of the genetic factors which have been operative in producing the deviations he observes in her behavior.* Then his prescription, which is couched in the terms of the steps she should take for retraining, should come next. It is the unconditioning and the retraining that should take the time—*not the analysis.* At present the analyst, at least for an astonishingly long time, reëducates the patient or attempts to reëducate her only or mainly along verbal lines. He won't even admit that he himself is reëducating her. Her reëducation according to the behaviorist's belief must be along manual, verbal, and visceral lines. She must be given a new manual life with a new verbal life and a new visceral life. Her old sets of habits will not work. But talking alone will never give her the needed new equipment.

To study all of these factors scientifically, we long for an Aladdin's lamp, so that upon command the genie would immediately transport our adult or child, all twisted by past faulty conditioning, into a wholly new world. We would have this new world filled with behavioristically

trained parents, teachers, and physicians who would build up a world in which the activity of hands and gut and larynx could each function dominantly where dominance of one was demanded by the situation, and could work in coöperation when the situation demanded the dominance of many segments of the body. In other words, we would ask that the individuals in need of retraining be brought up in a world in which something like complete integration of activities was possible without the presence of thwarting conflicts which come from the uneducated gut.

We would rub the lamp once more and ask its guardian to give us an infant farm adequate in all respects for the study of the behavior problems in the young, because we believe our technique has gone far enough even now to make it possible to bring up children so adjusted to life that they will never need to fall into the hands of the kindly analyst.

One trained as a behaviorist cannot help but grow more and more skeptical of the therapeutic value of *verbal catharsis* even as it is envisaged to-day. There comes to the analyzed, to be sure, a glibness of talk about herself—her symptoms, her fixations, her libido, her repressions. Oftentimes I feel, in talking to analyzed people, that the analyst has gone off and left the larynx running without hitching it up to the rest of the body, the way unskillful hypnotists used to do when they left their

subjects incompletely awakened. They seem to me to be very poorly integrated. As behaviorists we have grown skeptical too of psychoanalysis as a sound method. The reason for the failure of analysis is due to the practitioners' complex, clumsy, top-heavy presuppositions which lead them to search for something which does not exist. The presuppositions influence not only their methods of working, but their findings. There is far more than a mere terminological difference between the behaviorist and the analyst. Analysis based upon its present technique and premises will probably disappear. It will at least give place to a technique which will provide for conditioning and unconditioning on a recognizedly experimental basis. Hasn't the basal training of the analyst been one-sided, without sufficient orientation in the genesis of behavior? He needs his training in medicine, but before he takes his medical work he should study animal psychology. He should build himself a few animals, get a technique for conditioning and unconditioning, see what animals can be conditioned to, when males are brought up with females, females with females, when the animal is punished for sex responses; see how, as the problem becomes more difficult (*e.g.*, when differential responses are set up to two stimuli which differ little in stimulating value), the animal's habit systems break down; get first-hand acquaintance with how fear responses can be conditioned, wildness

removed. Surely, too, he ought to have opportunity to parallel this work on human infants. Let him do a little making and unmaking there, and watch the growth of the child's word world and its correspondence with and lack of correspondence with his object world. He should learn, too, that you can build up a whole string of emotional reactions, then tear them down; that you can implant, alter, and wholly change vocational patterns, and all without any psychoanalytic patter! Why not soak the future analyst in genesis and give him more fertility in the arranging and alteration of situations by means of which he can uncondition and later recondition his patients? Why not have him grow into an experimental analyst, which will save him from the armchair method he now employs? Shouldn't we give this same general training in animal and infant psychology to the mental hygiene workers, too? It is hard to understand why the field of animal psychology has been so long neglected. A large number of the basal problems in method and technique in psychiatry and analysis can be worked out in the animal field.

There are some pedagogical implications in the doctrine of the unverbalized. The use of words increases our "control" over the environment. Shall we say that in the neighborhood of 90 per cent—to make a rough guess—of our reactions are verbal? At any rate, man is a word-reacting, word-manipulating animal. Not to

have verbal substitutes for our activities and their stimuli takes us back far toward the world of the infra-human.

Can you picture for a moment the behavior of a well-trained inventor—not just a dumb manual worker, as are so many of them who work only with their hands upon odds and ends? Let us suppose that some stimulus —a factory situation or the words of a friend who is having mechanical difficulties in his plant—starts the inventor off. He begins verbally to put springs and levers and switches together. He goes as far as he can in the verbal assembling and working out of his machine. It begins to get complicated. His hands begin to itch to make a model of wood or steel. It will not work when put together. This leads him to further verbal manipulation. This continues until the immediate difficulty is verbally solved; then he must work again with his hand and again with his verbal world. He manipulates this word world at night when the lights are out, when walking to and from his work in a trial-and-error way, when his wood, iron, and tools are not at hand, just as he manipulates his materials when they are present.

It seems unfair to the developing child not to bring this *word world* up to a higher state of usefulness than is now done in schools. Every time I question young children and even college graduates I am struck by their dumbness, by their inability to tell how they do things, and to manipulate verbally their material and social

world. Why can't we teach the child from the beginning to verbalize his manual activity? Why not throw away text-books, give brief verbal or written problems, then let the child work out his problem in chemistry, physics, agriculture, cooking with his hands, and write and talk out his technique as he goes along? God forbid that I should seem to advocate more talking, as such, in the world! That is not my purpose. We have too many philosophic verbal speculators, rhetoricians, poets, and dreamers now. Talking without being able to translate into manual behavior or acting manually without being able to translate into words does not give complete integration. Here is an example. In front of me are the complete parts of a pendulum clock. One child can glibly talk for half an hour about this clock or any other clock, but at a superficial level, slipping almost immediately into the æsthetic values of the clock, history of clocks, etc. But he cannot put the parts together. He knows clocks in terms of words only. In contrast, another child the same age, deft with his hands, can take these cogs, escapement, wheels, pendulum, and springs and put them together, but when I cover up the clock and ask him about the inside of the clock and how the parts are put together, I get nothing. He is dumb. He has no words. I have another child in front of me equally deft with his hands and with his words. He puts the clock together. Again I cover it with the cloth. He

tells me correctly about every part—how they are put together and how they function when put together. In other words, he builds me a perfectly good verbal clock, while I wait. In my opinion the third child—by nature, not better fitted than either of the other two—has outstripped them by a distance comparable in some respect with the span that separates man from the orang. With a word world adequately substitutible for the object world he is, to some extent at least, master of his own destiny, independent of the world of sights, sounds, smells, and tastes. Unless some one robs him of the organization of his larynx and its related musculature, no one can quite pull down his world.

Is it too unattainable a social ideal to believe that every man, woman, and child should be trained about his own organism as thoroughly as the last boy was trained about the clock? We could very quickly teach children enough anatomy to give them a thorough working notion of their body, nervous system, heart, lungs, liver, kidneys, glands, sex apparatus. Then we could teach them enough physiology for them to grasp what the function of each main part is and how the various parts function together. Shouldn't we do this early and so thoroughly that no old wives' tales can ever again find a lodging place? Isn't it more important for them to get this early—this exploration of themselves—than

to get their literature, geography, history, chemistry, and physics, important as these subjects are?

Next we should teach the rudiments of hygiene (what many call "mental hygiene"), show them in the simplest kind of terms how infantile unverbalized behavior arises and how it is carried over into adult life; teach them about fear, love, and anger reactions; work out with them how the individual behaves in depressions. Teach them what exhibition behavior is like; how easily seclusion behavior develops, about invalidism and other nascent psychoses. Teach them first how to spot these reaction patterns in others, and then, most important of all, how to spot them in themselves by watching and tabulating their own behavior. What boy or girl taught in this way could not check his own behavior three or four times a month? "For days I have fought with my parents—two or three times in the last week I have been depressed and have tried to find excuses for not going to school and doing my other work." Or, to change the picture, "I have been getting entirely too boisterous and loud, too excited; driving the automobile too fast; taking too many risks and dangers in swimming and diving." Or again, "I find I am avoiding people more than I used to—I like to get in a corner and read. I don't go out on the streets very much." Or once more, "I find that I am going with girls very much less than I used to and that I have begun to gang up with boys in the neighborhood."

Having taught individuals to observe their own behavior in this way, as they observe the behavior of others, can't we next teach them what to do when their records show that they are getting into jams? In other words, give them the essentials and rudiments of corrective hygiene? For example: "All my work has slowed down. I am lacking in pep, don't care whether I go to see anybody or not; I have been leading a humdrum existence; things haven't gone right at home. I guess I'll talk to my physician. He will probably tell me I had better pack up and go for a week's fishing or hunting and that when I come back I'd better change things around a bit —try to do more interesting jobs, get some hobbies going that I have been flirting with for a long time, and to reach some satisfactory decision about my sex life which has been bothering me lately."

I would give this training before the fourteenth year, since at this age the great mass of our population gives up its schooling. Can young children get all this? I am hopeful of it. My business experience has opened my eyes to how simply things can be put to the public—how in homely words nearly all the worth-while truths of science can be set forth.

Unless the child has a word organization—a word for every situation—and unless the stimulus can arouse a verbal reaction simultaneously with the manual, which in turn, acting as a stimulus, can arouse a substitutive

manual reaction, how can the *larynx* (and its related musculature) *ever become dominant?* To-day we are predominantly a verbally reacting animal—this means that the laryngeal segment is the repository of most of our social and ethical training. Now if the stimulus does not activate this segment, "precepts," "shalls," and "shall nots" can never arouse socially acceptable substitutive reactions. It seems to me that almost the whole of ethics hinges upon the extent to which the child can be verbally organized.

You can see what society might have as its goal—every boy and girl by the age of fourteen to know his own organism and its reactions, as in my example the boy knew his clock. This would lead the organism to be *behavioristically self-correcting,* just as now the body unaided (unless too pronounced an infection sets in) heals its own wounds. In other words, on this hypothesis, the laryngeal segment—the verbalized—will become regulatory of all behavior. It will then dominate the gut. Now everyone admits that the gut is the tail that wags the dog.

The youth of fourteen, trained in this way, may not know as much literature, history, and mathematics as the youth of fourteen to-day, but he need fear neither the psychoanalyst's unconscious nor the behaviorist's unverbalized.

This discussion of the unverbalized leads us almost inevitably into a consideration of personality.

CHAPTER VII

CAN THE ADULT CHANGE HIS PERSONALITY?

ARE people born with a definite personality? Is personality something innate, hereditary, and unchangeable?

Or is personality a product of environment? If so, a different personality can be built into each and every individual. Theoretically, then, it can be altered, made to expand, be stunted or dwarfed almost at will.

The behaviorists accept this latter view. Personality is man made—is not a divine gift.

What, then, is personality? We hear the word used on all sides: "Her child is only three and yet she already has a lovely personality." "Helen at twenty-four is not pretty, but she has such a divine personality!" "Strong," "fine," "interesting," "striking," "gifted," "dwarfed," "unpleasant," "starved," "fascinating," "difficult," "disagreeable," "sinister"—are words often used to describe personalities.

From the way the layman talks and writes about personality it is easy to see that he thinks of it as some

vague, mysterious power which is born in man. The behaviorist, carefully watching as he does the growth and development of human beings from infancy to adulthood, finds nothing mysterious in personality. May I sketch for you his newer, more common-sense objective picture of personality?

We find, by studying the human young from birth onward, that all normal human beings are born with about the same birth equipment—that this birth equipment is very inadequate and very simple. It consists of such things as sucking; grasping; closing and opening of hands; movements of fingers, and toes; movements of trunk, legs, and arms; nursing; respiration; breathing; heartbeat; digestion of food; elimination of waste products; and the like—a very sorry equipment when contrasted with that of the young monkey or even of the young guinea-pig (which is independent of the mother at the end of three days)! In a word, we find little in inheritance which makes one healthy child start out differently from another child.

As pointed out on page 32 it is very much nearer to the truth to consider that all children start at birth with a set of simple responses which we may call *"squirmings."* What squirmings are taken up and developed into personality patterns depend largely upon the household and the level of society the child is born into. Our personality

is usually but a composite replica of the personality of our parents and other close associates.

This genetic study of behavior gives us a new way of looking at personality. As the human young passes from infancy to adulthood it becomes organized in a thousand different ways. Different systems of activity develop. In early childhood an individual at three may exercise himself with tearing the limbs from insects, pulling worms apart (why he starts this may depend upon a thousand factors—children deprived of meat often even at this early age actually kill and eat insects and worms). At fifteen he may be assistant to a butcher and learn to cut up meat. At twenty he may enter college and become an excellent student of physiology, being especially adept in vivisectional experiments. Later he goes into medicine and becomes an expert surgeon. Here we trace an activity trend from three years of age onward. A cross section of this individual's activity at any age beyond three would show the thread of organization later to appear as surgery.

Let us take another case—this time in the emotional realm (and it must be remembered that emotional behavior is learned like any other behavior). The only boy of a mother is petted, loved, and kissed to excess. At two the father dies. The mother makes an inseparable companion of the boy. She takes him to sleep in her room and finally into the same bed. The boy is

tender and courteous to all women. He is sensitive and shy and retiring. His mother keeps him from associating with girls of his own age and puts obstacles in the way of his marrying, threatens suicide. She puts great stress upon manners, dress, formality of behavior. At every moment the mother is doing something which will have influence in shaping this child's personality. What she does will have continuous influence all through his life.

To get a simple central point of view, let us look upon the organization that begins at birth and ends with death as an ever-widening stream of behavior. If we take a cross section of this stream at one year we will find the beginnings (often pretty complete!) of many patterns of behavior—vocational and emotional. At four years a cross section will show those same patterns, only grown more complex, and some new patterns; at fourteen the same patterns and still additional ones; at thirty the same, and still some new. But alas, beyond this point further elaborations of old patterns rarely take place, and still more rarely do new patterns form. There is no reason for this untimely death of variations in personality at this comparatively tender age except for the fact that most people have become too well fed to learn.

If we take a cross section through the habit systems of any individual twenty-four years of age, we would define his personality as *the sum of activities that can be discov-*

ered by actual observation of his behavior over a long enough period of time to get reliable information. In other words, my personality is but the totality or sum of my habit systems, my conditionings. What I am at any age is just what I can do at that age.

HOW TO STUDY PERSONALITY

We learn about an individual's personality by studying him in action. We make an informal inventory of that person's behavior patterns. We do it for strangers much better and much more accurately than for friends with whom we have grown up. We do not do it scientifically. We don't need to. Our rough working judgments are sufficient guides to admit a given person to our social group or to deny him admission.

The other day a stranger moved to a small suburban town where some fifty or sixty families live in a close social group. It was interesting to hear the comments of the residents after a club dance. "He is simply awful, so gauche." "He is cocky—told me that all women were quite mad about him." "He is terrible-looking, an awful dancer, and he knows nothing." We need not proceed with his crucifixion. In the stretch of a single evening his personality was judged and thumbs were turned down. The sun might well halt in its course before this gentleman makes society in Petronia.

Can the Adult Change His Personality?

As laymen we rarely judge the personality of others. A man of the world meets a highly estimable business man who is religious. This one bit of organization damns the chap in the eyes of the man of the world. "Oh, he is a psalm-singer." How often we hear these condemnatory judgments: "He drives too hard a bargain." "He's your friend only so long as you are on top." "He is a tale-bearer." "She can't keep a secret." "She overdresses." That phase of an individual's organization which runs counter to our own we condemn. The early psychoanalysts claimed that, being completely analyzed, they had no beams in their own eyes, no tender spots to be stepped on, hence they alone could make objective, unprejudiced judgments about personality. Many of the present-day analysts realize that they are not made gods by analysis. What they claim is true in general, though. A layman can with the greatest difficulty report upon that side of his own personality which has its roots in his early emotional experiences. So much of it lies below the verbal level.

METHODS OF STUDYING PERSONALITY.—PSYCHOLOGICAL

Psychology has made some progress in the study of personality during the past twenty-five years. Not nearly so much progress, though, as certain mental testers would

have us believe. Mental testing for business purposes especially has been oversold. Twenty years ago Münsterberg began overselling. For him psychology was destined to solve all of the personnel problems of the manufacturer. A few years later mental tests were touted as a genuine scientific instrument for measuring the caliber of individuals.

Just to give you a general idea of a mental test let me sketch briefly what a twelve-year-old mental test is like.

1. The boy is given a vocabulary test—asked to tell what several words mean. In a standard vocabulary test he should be able to define 20 words out of 100 correctly.

2. We next give him abstract words to define—*pity, revenge, envy, justice.*

3. We give him a lost-ball test. We draw a circle and tell the youngster that this circle represents a field—that a ball has been lost in this field. Then we tell him to take a pencil and mark out the path he would travel to hunt for the ball so as to be sure to find it.

4. We next give the child dissected sentences printed in capitals. The words must be placed in such order that they will make perfect sense.

5. Next we read him fables such as "The Fox

and the Crow," "The Farmer and the Stork." He has to tell us what moral the fable teaches.

6. Then we make him repeat five digits backward.

7. Then we show him four pictures and he has to tell us what each is about.

8. Finally we ask him to point out the similarity in three things; for example: *dog, horse, crow.*

Literally thousands of standardized tests are in existence. School progress is graded by them. Students are admitted into college, salesmen are selected, normal children separated from sub-standard ones, feeble-minded ones picked out, bright children lifted out of the herd—all by the use of tests.

The behaviorists do not quarrel with tests. They quarrel only with the exaggeration of their importance in the hands of certain schools; for example, those of Terman and of Thorndike. They are good as far as they go. But they are not "mental" tests or "intelligence" tests. Nor are they the whole of psychology or even a large part of it. They are more or less *random samplings of the individual's organization at a given age* and particularly of the *verbal organization* of the individual tested. They are in no sense an adequate basis for the selection of personnel or even for making ordinary personality judgments.

In the first place they tell us nothing of the special vocational abilities of the individual tested. They tell us little of his manual equipment (what he can do with his hands, legs, body). The testers themselves admit this. To offset it, they have devised many so-called special-performance tests. In the army an experimental testing-ground was set up for testing automobile and truck drivers, for the selection of night scouts, for the securing of positive military intelligence, for telegraphers, typists, stenographers, and for many types of vocations, such as carpentry, wood-working and metal-working.

Unfortunately, there are many vocations in life in which no form of testing is applicable. Who would attempt to pick out by any form of general intelligence or special-performance tests a good business executive, a good newspaper man, an advertising man, a good department-store buyer, literary material of the first order?

My general point of view on psychological tests is that while they may help us to separate the sheep from the goats, they do not tell us much about the flock of sheep left from which to make our individual selections.

I have a still more fundamental criticism of the mental tests in industry. It seems to be the general experience of business executives that men and women fail in their jobs, not from lack of intelligence—the manufacturer expects to have to train his individuals—but because of faulty emotional organization. They are surly, easy to

anger, easy to weep, easy to have their feelings hurt. They are shy, sensitive, afraid to tackle new jobs. They are lazy, don't want to work overtime, don't want to be crowded with work in emergencies. They lack neatness in their work. They don't take responsibility. They are enthusiastic for the time being, but the glamour of the job wears off soon. They are always "hard-done-by." They never get enough for their work. In other words, the emotional part of our equipment is just as important as the manual and the verbal. So far no mental test has been devised which will tell whether a man is a liar, whether he has the guts to stick to his job in the face of considerable problems, whether he is a persistent worker or a clock-watcher and a washroom loiterer, whether he is able to work in coöperation with other individuals.

EVERYDAY METHODS.—WHAT CAN YOU LEARN BY INTERVIEWING?

I gather something—not a great deal—in my first personal interview with an applicant. I can observe whether or not his personal habits are of the generally accepted kind; whether his nails are clean, his face washed; whether his linen is both frayed and dirty; whether his clothes are unpressed; whether his shoes are blacked; whether he has any command of the English language. There is an impression going the rounds that an applicant

should be able to look you in the eye. Some employment managers try to bore into the applicant with their own eyes to see whether the poor fellow can stand up to it. This is just an old wives' tale. I wouldn't want him to look me "squarely in the eye" any longer or any oftener than good manners call for. What you can learn from one interview is very meager. It is always better to have several interviews.

DOES EDUCATION COUNT?

Executives to-day for worth-while jobs are scrutinizing carefully the educational chart of the applicant. Did the applicant finish his grade school or did he drop out at twelve or fourteen years of age, where the great mass of our young Americans drop out? Did he finish his high school and his college work? Naturally, he doesn't have to be a college graduate in order to be a good man. But if he started college and dropped out at the end of one or two years, I certainly want to discover whether it was absolutely necessary for him to drop out. If he dropped out because he didn't have the guts to finish or because he got into difficulties with his studies, I shouldn't, as a rule, want to consider him. I would rather pin my hopes to a fellow who, even under great economic pressure, finished his college work.

In spite of the numerous exceptions to the rule, the

college-bred man does seem to last longer in business and to get along in business better than the non-college graduate.

THE INDIVIDUAL'S PAST

The next thing the behaviorist looks at in this common-sense way is the length of time the applicant stayed in each of his various positions and the yearly increases he received in earnings. The man who has had ten jobs between twenty and thirty is a "floater." He will probably go on drifting until he is sixty. After that he joins the army of dependents. On the other hand, if he has remained in an inferior position for too long a stretch of time I begin to suspect him of being lazy, of being fearful of new responsibilities—of not having thrown off his nest habits.

PLAY AND SPARE TIME RECORD

One needs to chart informally the sports and spare-time record of applicants. A study of this record is quite revealing. We know that outdoor activity leads to physical fitness, to keenness in competition, to steadiness in coördination. We know, too, that a man who can compete with other individuals can usually work with other individuals.

EMOTIONAL MAKE-UP

Studying the emotional make-up of the individual is most important. Unfortunately, it is difficult to get anything like an objective record of a man's emotional make-up until you have had him under observation for a considerable length of time in the situation or job in which you want him to function. Close observation of the individual for six weeks gives a very good picture of how he stands up under pressure, of his honesty, of his neatness, of the persistency of his work habits, of his sensitiveness, vindictiveness, whether he is overbearing, seclusive, cocky, whether he takes criticism unkindly. Most of us carry along a lot of our infantile emotional organization. Observation under pressure will show its presence. I am frankly afraid of the man who carries over too much of this bad emotional equipment from infancy.

This short sketch on the ways of judging personality should convince anyone that there is no scientific standard to use in the study of personality. At best our study must be slow, and we often make serious errors.

HOW THE CHARLATAN JUDGES PERSONALITY

To hear the "character analyst" talk, one would think that the psychologists and physicians who devote their

lives to the study of personality have not kept up with the times. These "experts" profess to be able to "read" personality at a glance. They are preying on manufacturers and employment managers generally. Sometimes these fakers have institutes of their own. Many of them advertise, even in some of our better magazines. Chief among them are the so-called "head-hunters." There is at least one big institute in New York that takes annually out of industry to-day a comfortable fortune for selecting men on the basis of head measurements. They make a large number of these measurements, such as the distance from bottom of chin to mouth, size of mouth, the distance of the nose from the ear, the length of the nose, and the like. To offset such claims one might ask any of these gentlemen to go with you to the places where immigrants are tested. Ask them to pick out the defectives from the normals by head measurements.

Any legitimate psychologist would be only too glad to avail himself of the services of these head-searchers if there were any empirical validity in their method.

Dr. Yepsen of the Training School at Vineland, N. J., wrote me not long ago: "We would like to have a little money to take a series of motion-picture photographs to show that it is utterly and absolutely impossible to pick out even the feeble-minded from the normal, because we feel it would be a good thing if industry actually knew these facts." If the head-searchers cannot select "feeble-

minded" from normals, how can they expect to pick one man for writing, another for selling, and another for executive work? Why should industry not rid itself of these hawks that prey upon the psychologically ignorant manufacturer?

The next type of "expert" is the one who claims to be able to read the personality and character of individuals from photographs. You don't actually have to bring the applicant in front of him. All you need to do is to show him a photograph.

Challenge these "experts" to a photographic test to be made under these conditions: The psychologist is to be allowed to go to a home for the friendless and pick out half a dozen bums who have been bums since they were five years of age—men with known records. He is to go to Sing Sing and pick out six prisoners, persistent criminals from adolescence on. And then he is to pick out twelve of the finest men that he can get in science, or in academic or business life. He is to take them all to the barber shop for a clean shave and a fashionable hair cut. Next he puts them all in evening clothes and then photographs them. The "gifted" character analyst must pick out the six bums and the six criminals from the twelve very famous men. I have tried unavailingly to get these men to accept this eminently fair set of conditions and put their skill to the test.

There is another group of these fakers, advertising

also in our best magazines, who agree to pick your employees on the basis of hair color, texture of the skin, and color of the skin. To dismiss such claims, I need only mention here the fact that in some of our large experimental laboratories we have been trying for years to correlate "general intelligence," special abilities, and the like with color of the individual's skin, the texture and color of the hair, and the like. All the findings show that there is not the slightest scientific evidence supporting any of these claims.

Just let me numerate a few other types of fakers. The phrenologist is another rapid personality reader. The bumps on your head, so he says, reveal everything to him; a bump means a development of a certain part of the brain in which a certain capacity or vocation resides. By charting the bumps, therefore, he charts the individual's abilities. Unfortunately, the bumps on the skull have nothing to do with the shape or the size of the brain. Indeed, a bump on the skull may mean a slight constriction of the cranial or brain cavity, because a bump sometimes works both ways—pushes both out and in. The brain as a rule, however, is smooth and is almost floating in a liquid. Beside, we have given up brain "faculties." Phrenology passed out of the interest of scientific men many, many decades ago.

Then we have the graphologists, those who would tell us by our handwriting what our potentialities and charac-

ters are. The way we dot our i's, cross our t's, whether we leave our o's open or not, the way we slant our letters, all are definite revealments of personality. Let us not be too hard on them. It is an amusing avocation, this reading of character by signs. Certainly we can get something from the handwriting of an individual—whether he is so extremely careless (or so emotionally disturbed) that he doesn't finish words, whether or not he writes hurriedly, and so on. In handwriting, of course, we have a definite product left behind by activity, and hence it may give us some kind of clue as to the person's character, just as the tombs of the ancient Egyptians reveal something of the character of their civilization. Several psychologists have been studying this matter carefully and are still studying it. So far, however, the correlations they have found to exist between certain kinds of writing and certain kinds of ability have been very sketchy and very insecurely grounded.

I think we can lay it down as established that there is not one grain of truth in the claims that the head-hunters, skin and hair searchers, bump-measurers, and handwriting "experts" can make a proper selection of personnel. Where the psychological fakers are doing harm, exclusive of the great economic waste in using them, is in the prevention of the establishment and spread of scientific methods. The business man is made to feel that the selection, placing, and promotion of personnel ought to

be done by some kind of prestidigitation or even by the use of miraculous methods. The psychological fakers disturb the worker himself. I cannot tell you how many times I have had individuals come to me seriously distressed about their vocations. They were doing well in their work, but some characterologist had informed them that their future lay in grand opera, in diplomatic work, or in some field other than the one in which they were working, and they felt that they ought to give up their present jobs to seek this unknown, untried, and, therefore, roseate future.

From this study of personality we can gather that industry has no ready-made tool the exclusive use of which will enable it to select and promote its personnel with any degree of surety. Unquestionably, where psychologists have come into organizations which have to select yearly a large number of individuals, their intelligence and performance tests have been helpful. The performance tests should be built for the particular industry in which they are to be applied. Under these conditions the psychologist must be allowed considerable time to study the general features of the business, the different types of operations, the different levels and types of personnel demands, and the general situation and social conditions surrounding the plant.

I think the conclusions of most manufacturers have been verified. Their own experience has taught them

that *there is nothing like daily observations over a period of some months for measuring the capabilities, the ability to learn, and the emotional make-up of applicants.* Many great industries run training schools. I don't believe the psychologists have anything better to offer than these schools. I ask only one thing: that they be conducted jointly by people who actually know the industry and by psychologists who have had some training in industry.

DISTURBANCES OF PERSONALITY

Since we are what our sum of habits makes us—since we are our systems of habits in action under the dominance and leadership of now one, now another, then anything that throws any one system of habits out of gear limits or injures our personality. A sore foot robs us of our balanced stride in walking, we limp and favor the injured foot. If our right arm is stiff and sore, tennis becomes impossible. But the limitation to our personality is slight. There are millions (literally) of other habit systems ready to function (alternate or substitutive functioning). We feel quite sure, somehow, that if a man can still talk coherently and logically about who he is, where he is, where he was and what he did yesterday, the day before, last month and last year, his personality is intact. This is because man is a word-reacting animal. We judge his balance and sanity (as laymen) by the

coherency of his speech. In the previous chapter I made the wild guess that 90 per cent of human reactions are word reactions, including under word reactions both spoken words and thought words (inner speech or thought). We have so many hundreds of thousands of speech habits at our disposal that nothing short of an avalanche of disaster can seriously disturb our word organization.

And yet even speech organization gives way at times. We see it giving way in the onset of drunkenness—slowing of response, difficulty of uttering certain words, inability to answer questions, inability to finish sentences or even words of more than one syllable, then complete loss of speech and resulting coma. In the administration of an anæsthetic something similar takes place. In the struggle back to normality after prolonged anæsthesia we find a still more interesting group of changes. The first articulate word may be the patient's own name or the name of husband or wife, then silence, then the name, then several reiterations of the name, then silence. Then "so dark"—"so dark"—"I suffer." Soon more and more complex habit systems reassert themselves. In an hour the patient is talking normally again. Although the patient may be paralyzed from the neck down, we speak of him as being "himself" again as soon as the speech reactions become normal.

These are common disturbances of personality experi-

enced by many. How they differ step by step from the graver psychopathological cases is not known. In diseases popularly described as manic depressive insanity, paranoia, dementia præcox (names which are being given up by psychiatrists), profound changes occur in personality. The most interesting thing about these cases is that the personality disturbances are the main symptoms. There is often no evidence of organic deterioration (brain lesions). For this reason these diseases are often called functional psychoses.

A few years ago we used to hear a lot about "altered personality," "double" and "triple" personalities, changes of personality under hypnosis, in trances; and many similar mysterious types of disturbances of behavior. Most of the observations in this field have been made by old-time methods and by men trained in the old school of psychology. A complicated terminology has grown up. The observers expected to find something and really assumed its presence at the start. The whole field should be gone over and over by psychiatrists trained in the behavioristic point of view. I personally do not believe there ever was a genuine case of "double" or "triple" personality. Even "normal" men behave one way in front of their wives and another way in front of their mistresses; one way before their drinking companions and another way in the presence of their employers. We live different lives in front of different

people. We have done this since infancy. A psychologist impressed with hypnotism could build "double" personality into a psychopathic patient in a very few seances without knowing it, and in later sessions "discover" that the patient had a marked case of "double personality." He could group the kitchen habits and produce "Tillie, the scullery maid"; group the social graces and produce "Tillie, the parlor coquette." He could then begin the cure of the patient—unite the two personalities into one —and he might never know that he was really fooling himself, that he had first built up the double personalities and then had torn them down.

CAN AN ADULT CHANGE HIS PERSONALITY?

This is the question most often asked the behaviorist. The answer is *yes* if he works hard enough. There is no scientific reason why personality cannot be changed. But the practical limits of change are usually narrow indeed. Think of the millions of habits and conditionings set up from infancy to the thirty-year age. Then remember that personality is a cross section of all this organization. Can you change all this in a few short days or weeks? "I am shy. How can I change?" "I am an exhibitionist. Can I overcome it?" "I am afraid of women; I am attracted to them, but when I get around them I am terrified." "I can't lecture. I become afraid every time

I get up to speak." "I am quarrelsome and noisy and boastful. What should I do about it?" These are some of the questions. The populace wants to be told some simple trick that will change personality without work. I used to feel quite hopeful of reconditioning even adult personalities. I grow more skeptical, as I grow older, of fundamentally changing adults by the psychological and psychoanalytical methods now in vogue. My skepticism arises not so much from a conviction that it can't be done as from my knowledge of the laziness and carelessness of people. Few of us have the guts to stick to the long, arduous routine we should have to follow. Theoretically you can change a personality as long as the individual can *learn*. But as a rule we do not have sufficient control over the life of the individual, even if he were to put himself in our hands, to set up reconditioning processes. Possibly if we had absolute control over *food, sex, shelter,* if we had some great reconditioning laboratory where the individual could be brought for a year for rigorous study and experimentation, we might be able to undo for him in a year what home nurture had done for him in thirty years.

But with humans as lazy as they are about themselves and lacking this experimental set-up, the zebra can as easily change his stripes as the adult his personality.

8:20 A.M. July 18-1926
On U.P. Fly in Nevada
On way home from W.S.S. Convention - 14
Book not much good

INDEX

Acts, untutored, 21
Activity, different systems of, 118
  "mental," 79
  physical, 79
Adolescence, 46
Adulthood, 60
Ambidexterity, 31
Analyst, basal training of, 108
ANGELL, J. R., 6
Anger, 23
ANREP'S, G. V., 52
Appropriation, 23
Argument, vs. behaviorists' view of instincts, 38
Arteries, 44
Autonomic system, 45

Babies, emotional reactions of at birth, 53
  experimental study of, 53
Behavior, conditioned, 21
  differences in, 13
  implicit, 85
  stream of, 119
  study of, 12
Behaviorism, 1, 2, 5, 6, 7, 8, 9, 64, 78, 95
Bents, 37
Bible, 48
Bicycle riding, 42
Biologist, 28, 29
Biology, experimental, 16
Birds, behavior of, 22
Blinking, 18
Body weight, 39
Bottle, 41
Brain, 75
  weight, 39
Breathing, 40
BREUER, JOSEPH, 94
BRIDGEMAN, LAURA, 88
BURBANK, LUTHER, 29

Carry-overs, 74
Capabilities, 27, 36, 37
Care, psychological, of child, 113
CASON, HULSEY, 52
Catharsis, 107
Changing personality, 137
Character analysis, by use of photographs, 130
Character analysts, 128
Chest, 84
Child, the, at twelve months, 97
  becoming socialized, 87
Childhood, 46
Children, gifted, 30
Cleanliness, 23
Climbing, 23
Command, military, 41
Common-sense, 15
Complexity, of emotional behavior, 56
Conditioned, fear reactions, 57
  fear responses, first, second and succeeding orders of, 105
  love responses, 58, 59
  rage responses, 58, 59
  stimuli, 18
Conditioning, 18, 19, 28, 40, 41, 42
"Conscious," the, 99
"Consciousness," 3, 6, 7, 8, 75, 99
Consolidation, of deeds and words, 91

Index

Constitution, 36
  fundamental, 42
Control, 16, 19, 20
  psychological, 8, 9
  social, 48
Cross section, through habit systems, 119
Crying, 18, 54

Darwin, Charles, 16, 22, 23, 24
Deaf-mute, 70, 76, 87
Defectives, 31
Dementia praecox, 93, 136
Descartes, René, 79
Descent, theory of, 16, 22
Despondency, 46
Diagram, of emotional conditioning, 58
Diaphragm, 44
Differences, in structure, 36
Disintegration, of muscular systems, 73
Dispositions, 27, 36
Disturbance, of personality, 134
Disuse, 71
  of a function, 67
Dogmas, religious, 79
Dogs, swimming of, 22
Double personality, 136, 137

Education, 126
Emotional behavior, 46, 56
  everyday problems in, 53
  genesis of, 52
  simplicity of at birth, 59
Emotional equipment, 26
Emotional make-up, 128
Emulation, 23
Endocrine glands, 52
Environment, 18, 37
Equipment, emotional, 34
Ethics, 48
Eugenist, 25, 28
Experiments, upon fear, 57
Exultation, 46

Failures, social, 20
Fakers, psychological, 133
Family traits, inheritance of, 26
Fear, 23
  experimental study of, 57
Fears, in man and animal, 104
Feeling-tone, 6
Finger, sucking, 40
Food, 39, 45
Footstep, of mother, 41
Formula, 55
Freud, Sigmund, 5, 26, 48, 61, 94, 95, 96, 97
Functioning, of hands, guts, and larynx, 107
Fundamental constitution, 42

Genesis, of emotional behavior, 52
Gifted children, 30
Gland, duct, 52
  salivary, experiments upon, 50, 51
Glands, 3
  ductless, 45
  lachrymal, 45, 49
  salivary, 45, 49, 50
  sex, 45
  stomach, 45
  sudorific, 49
  sweat, 45
Glandular response, conditioned, 51
Gloominess, 46
Goal, of behaviorist, 2
  of psychology, 20
  of society, 115
Guild, system, 35
Gut, 44, 45
  conditioning of, 52
  disturbance of, 62
  training of, 60
Guts, 138
  teaching of, 50
Graphologists, 131

Habits, bodily, 50
Hair, 45

Hampering, of movements of new-born as stimulus to rage, 55
Happiness, 47
Heart, 44, 49
  beat, 54
Heckscher Foundation, 61
Heredity, 31, 37
  of emotional patterns, 56
History, of individual's past, 19
Homo-ornithos, 24
Human young, birth equipment of, 117
Hunting, 23
Hygiene, teaching of, 113
Hypnosis, 136
Hypnotism, 137

Image, 6
Images, 75, 76
  auditory, 75
Imitation, 23
Implicit behavior, 85
Indigestion, 62
Individual, the past of, 127
Infancy, first two years, 29
  world of, 101
Infantile, emotional organization, 73
Infants, new-born, 13
  new-born, behavior of, 20
  first use of words, 83
Inferior race, 38
Inheritance, of mental traits, 25
Instinct, 13
Instincts, 21, 22, 25, 28
  inborn, 36
  James' list of, 23
Instrumentation, 14
Integration, 3, 107
Intelligence tests, 123
Interference, in thinking, 85
Inter-marriage, 25
Interviewing, 125
Intestines, 44

James, William, 6, 23, 28, 47, 64
Jealousy, 23
Jones, Mary Cover, 61
Joyousness, 46

Keller, Helen, 36, 77
Kempf, Edward, 100
"Kick," 19
Knee-jerk, 2
Koran, 48
Kreisler, Fritz, 77

Laboratory, Johns Hopkins, 50
Ladd, G. T., 6
Laryngeal segment, the, 115
Larynx, 84
Lashley, K. S., 50
Learned behavior, 47
Learning, 47, 65
  manually, 68
  verbally, 68
Lip reading, 87
Loss of support, stimulus to fear, 54
Loud noises, 58
Loud sounds, stimulus to fear, 54
Love, 23, 105
Lungs, 44

Man, as a verbally reacting animal, 115
Manic-depressive insanity, 136
Married life, 103
Mars, man from, 10
Mathematical ability, inheritance of, 25
Mechanist, 42
Medicine men, 79
Memories, auditory, 74
  visual, 74
Memory, 64
  facts about, 64
  general description of, 66
  images, 75
  loss, 71
  problem stated, 65
Mental diseases, cause of, 93

Mental, hygiene, 102
infection, 96
pictures, 74
testers, 29
testing, 122
tests, in industry, 124
traits, 27, 36, 43
Methods of testing personality, 125
"Mind," 24
Mind-body problem, 96
Mind, evolution of, 24
Modesty, 23
Moth, behavior of, 17
Mother fixation, 102
love, 105
Muscles, smooth, 44
unstriped, 44
Mumbling, 83
Musical ability, inheritance of, 25
Mysticism, 94
Myth, of the unconscious, 93

Nausea, 62, 85
Negro, 38
Nerve specialists, 82
Nervous system, 45
Nest habits, building up of, 102
Nurture, 28

Objections, to behaviorist's view of instinct, 37
Observation, 9
psychological, 13
Organic disturbance, 95
Organization, unverbalized, 105
Organism, 19
Organs, visceral, 44
Ourselves, 99

Paranoia, 93, 136
Parental love, 23
Pathology of mind, 94
Patterns, of behavior, 120
Pavlov, I. P., 50, 52, 56
Pedagogical implications, of the unverbalized, 109
Perception, 6
Personality, 116
definition of, 119
disturbance of, 134
how to study, 120
inherited factors in, 116
methods of studying, psychological, 121
Phenomena, of behaviorism, 9
Philosophy, 14, 86
Phrenologists, 131
Play, importance of, 127
Pleasantness, 6
Predestinarians, 43
Predictability, 16
Prediction, 1, 15
Predictions, 8
Propagandists, 43
Protoplasm, 28, 35
Psychiatrist, 93, 136
Psycho-analysis, 5, 104, 108
Psycho-analyst, 48, 93
Psycho-analysts, 82
Psychology, data of, 10
description of, 14
subjective, 6
Pugnacity, 23
Puritans, 60

Rage, 105
Random sampling of activity, 123
Rationalizing, 49
Reason, 49
Reconditioning, 138
Reëducation, 106
Relearning, 67
Resentment, 23
Respiratory rhythm, 54
Response, 2, 17
Responses, how built in, 39
in series, 41
Responsibility, 42

Rivalry, 23
RIVERS, W. H. R., 98

Salivary gland, conditioning of, 51
Sex, 39
Shame, 23
Shelter, 39
Shyness, 23, 46, 125
Situation, 2
Situations, home, 46
Skill, acquisition of, 67
  acts of, 50
Slants, 37
Sleeping, 41
Smiling, 18
Sociability, 23
Special abilities, 27
Speech organization, 135
Squirming, 28, 40
Squirmings, 32, 33, 34, 101, 117
Stomach, 44, 85, 95
Stimuli, conditioned, 18
  unconditioned, 51
Stimulus, 17
Strawman, 99
Stream of behavior, 119
Striped muscle behavior, 47
Strivings, 101
Stroking, of skin as stimulus to love, 55
Sucking, 40
Sulking, 74
Suppression, 71
SWIFT, DEAN, 82
Sympathy, 23

Talent, inheritance of, 25
Talents, 37
Temper, 29
Tendencies, 27, 36
Tension, of muscles, 44
Thesis, of the behaviorist, 27
Thinking, 14, 77, 83
  aloud, 88
  as activity of whole body, 84
Thinking, experimental study of, 89
  general lack of, 90
  objectively recording words used in, 90
Thought, a form of bodily activity, 84
  theory of, 86
Throat, 84
Thwarting, 107
Training schools, vocational, 134
Traits, inherited, 26
Transference, 104
Toy, 41
Twins, identical, 38

Unconditioned gut reactions, 53
Unconditioned stimuli, to gut reaction, 53
Unconditioning, 103, 106
  of emotional reactions, 61
"Unconscious," 92, 93, 96, 98, 103
Unpleasantness, 6
Unverbalized, the, 97, 98, 101, 103, 104
Use of body in thinking, 89
Use of words, subvocal, 87

Veins, 44
Verbal catharsis, 107
  tilts, 46
Verbalization, 77, 86, 102
Verbalizations, inward, 83
Verbalized, the, 97
Viscera, 44
Visual response, conditioned, 19, 40
Visual images, 77
Vocational tests, 123
Voice, of mother, 41
Vomiting, 62
Voodooism, 94

Weeping, 74
Wind-pipe, 44
Word, definition of, 97
  conditioning, 80

Word conditioning, at six months of age, 80
world, of the child, 110
Words, as equivalent to objects, 81
as substitutes for objects, 98
silently spoken, 82
use of, 76
World, of the unverbalized, 99, 100 101
WUNDT, W., 6

YEPSEN, LLOYD N., 129

Zone, sexual, 55

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